THE

FARMER'S MAGAZINE:

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(No. LVI.)

BRANCH I.

ORIGINAL COMMUNICATIONS.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Sorting and Manufacturing of Wool.

SIR,

YOUR ready insertion of my former communication, upon the proper management of Wool by farmers or growers (No. LIV.), encourages me to hope for a repetition of the favour, with respect to the following observations on the management of it by the manufacturers.

On this part of the subject, I labour under some disadvantage, owing to the art of stapling wool being little practised in Scotland, from whence chiefly I derive my information and experience.

In the great manufacturing counties in England, there is a separate order of men called Staplers, whose employment consists in purchasing and assorting wool, and selling it in lots to others, by whom it is cleaned and manufactured. It is obvious, that, in proportion to the previous care judiciously bestowed upon preserving fleeces free from every species of impurity, the labour of these wholesale and retail buyers must be proportionally lessened, and consequently they can afford to give the higher price. But when gravel, sand, mud, moss, the fibres of decayed vegetables, or the excrements of the sheep, are allowed to entangle themselves in the wool; or when tar, from its bad quality, or unskilful application, runs into knots or mats, not only thereby must a considerable quantity of wool be destroyed, or rendered of little value, but much time and expense must be thrown away, which otherwise might be saved. These circumstances are too important and glaring, to be overlooked by stap-

lers, and cannot fail to lower their offers. Nor is it improbable that the discovery of such defects in one parcel, may create a prejudice against all the wool in that immediate neighbourhood.

Fine fleeces, being mostly untarred, are prepared with little trouble; and being lighter from the want of tar and the filth that adheres to it, should sell more readily and at a dearer rate. Yet in many instances this has not been the case. In the current season they have rather declined in price, while coarse wool has advanced,—an effect which must be ascribed to some accidental, and perhaps artificial, not to any natural cause. For fine wool is more easily wrought in every stage of the process, and brings more profit to the manufacturer; and therefore the advance upon the coarse plainly evinces an increased demand for cloth made from wool of that description, among the lower orders of society; occasioned, probably, by the markets opened for it in the northern ports of Europe, which had been so long shut against the produce of Britain. But when the present demand shall be fully satisfied, it is natural to expect that fine and clean wool will regain its merited ascendancy, and that the coarse must either be better managed, or sink in value. Let not farmers, elated by its temporary preference, be lulled into indifference about its further improvement in quality and cleanliness: And let them not exclaim against staplers for buying at a low rate, and taking extravagant profits. For who would give a high price for a load of tar and nastiness?—and who would not think himself entitled to be well repaid for the trouble and toil of freeing wool from such noxious nuisances?

Every kind of wool must be thoroughly cleaned before it can be made into cloth; and with coarse wool, the process is difficult and tedious. Soap and fullers' earth are commonly used;—often a chemical preparation is necessary;—not unfrequently the operation is repeated;—and, after all, recourse must sometimes be had to the shears, to extricate the wool from small stones and clotted tar.

Fleeces are divided into 8, 10,* and even 12 *parts* or *sorts*, each differing from another in fineness. These *sorts* are next carefully classed, the finest in each fleece forming the first class, when the fleeces themselves are nearly of the same quality. In like manner a second, a third, &c. class is made up. But as the fleeces in the same flock vary more or less in fineness, (and much more the fleeces of several different flocks), the skill of staplers is displayed in putting together such *parts* or *sorts*, of each different fleece, as approach nearest to one another in tenuity and length of pile, colour, and kindly softness in handling.

* *Ten* is generally the number in Yorkshire.

The finest *sort* of Cheviot wool may correspond with the second or third *sort* of Southdown, and with the fourth or fifth *sort* of Spanish. Even the same kind of wool admits of much diversity. One pack† of Cheviot wool, may have one, two, or even three *sorts*, finer than can be picked out from another pack growing in a different soil and climate, or subjected to worse management;—so that, though there be only ten *sorts* of wool in any one fleece, yet there may be nearly twice as many *sorts* in all the fleeces of the same kind of wool produced in different parts of the kingdom, according as one fleece exceeds another in fineness, the coarse *sorts* of some being little inferior to the finer *sorts* of others.

Besides, even in wool of the same kind and fineness of pile, there may be a considerable difference with respect to the quality of coalescing readily and incorporating together in the mill. Some shrink much sooner and to a greater degree under that operation than others. This, no doubt, may arise from the different ages of the sheep; the wool of young sheep being more flexible, and having a more kindly propensity to unite and cling together than that of old. In this case staplers certainly can and should avoid the danger of mixing them in the same *sort*. But in other cases, where this tendency to mill freely or reluctantly, arises not so much from the age of sheep as from their pasture, or the treatment of their wool, the task of staplers becomes nice and difficult. Long experience, accurate observation, and strict attention, can scarcely secure them in every instance against erring.

The proper assortment of wool is a matter of the utmost importance in the manufacture of cloth. For it is really almost, if not altogether impracticable to mix wool of dissimilar qualities so completely as to produce a texture that shall be equal, firm, smooth, and durable. There is much less labour in separating the coarser from the finer parts of fleeces, than there is in incorporating them so as to make even a decent passable piece of cloth. It is therefore extremely injudicious in gentlemen and farmers who raise wool, to select a few of their best fleeces to be made into cloth for their own use; and it is very unreasonable to expect that any manufacturer can produce from them cloth nearly equal to what he brings to market from wool, naturally coarser, but carefully and judiciously assorted. They will find it to be their true interest, either to sell *all* their wool, and order such a piece as they want, or to send such a quantity as can be parcelled into five or six pieces of different qualities.

† A pack is 12 Scotch stone of 24 lib. English.

After all the pains of the most experienced stapler, wool must undergo a further cleansing process by the manufacturer. Formerly it was minutely teased with hands, and every mote and particle of sand carefully picked out. But since the introduction of water and steam machinery, that work is performed more expeditiously, and to better purpose by a *teasing billy*, which is a cylindric box with three rows of strong iron teeth placed at equal distances, having an axle in the middle, furnished with similar rows of teeth, and driven with prodigious velocity by water or steam. In this box the wool is tossed about and teased for little more than a single minute, till it is forced to quit every remaining particle of impurity, which falls to the ground through small apertures in a plate of tin or sheet-iron, placed at the bottom for that purpose.

The wool is next placed upon a sliding board, and slowly conveyed into a machine consisting of numerous cylinders, all covered with cards of pointed wires, and moving, some with greater, others with less rapidity. After being whirled round and carded through these successively, it is scraped, or rather whisked very gently and dexterously from the extreme roller by a kind of wooden scutcher, and carried to another machine of similar construction, from which it comes out in rolls or rows, which, both in Scotland and in the Northern parts of England, are known by the name of *rowans*, ready to be spun upon the wheel or the *jennie*.

This latter instrument has, in a great measure, superseded the use of the former; and, on several accounts, it merits the preference, spinning at an average thirty-six threads instead of one, and twisting the yarn more equally, softly, and better adapted to make the cloth close and firm like felt. It is a well known fact, that both lint and wool, spun beyond their *grist* or natural degree of fineness, make unequal and unthrifty cloth; whereas a thread, coarser than the materials might furnish, is more easily drawn, and more uniformly equal. Now from the nature of their motion, spinning *jennies* do not twist the thread too hard, nor draw it too fine. The cloth consequently should be soft, pliable, and fitter for undergoing the subsequent operations of the manufacturer.

By the weaver, the yarn after being warped, is anointed with a kind of unctuous batter, or *size*, with some care, to render it smooth and tough for bearing the friction of the loom, and of the shuttle running swiftly over it with the woof. It is of vast importance to the cloth, both in point of excellence and of appearance, that the warp and woof shall be perfectly equal, or very nearly so, in fineness of thread; and special care must be

taken, when they cannot be got quite alike, that the woof shall rather be more gently and softly twisted than the warp, otherwise the cloth will neither look nor wear so well. As the woof should never be driven too closely together, and as the most dexterous hand cannot always give precisely the same force to every stroke of the *lay*,* there can be little doubt that the use of water or steam machinery in weaving must be a desirable improvement, because thereby the fabric could be made nearly or wholly *square*—that is, the threads in the woof would all stand at the same distance from each other as those in the warp, and leave all the interstices of the same *square* form and size, supposing the yarn to be quite equal in every respect.

These previous precautions would greatly facilitate the operation of the fulling mill, where soap, fullers' earth, and *chamberley*† are employed, according as the case may require, to free webs from the glutinous stuff fixed upon them by the weavers, and from any greaze or oil which may still adhere to them, and to assist in compressing them into a proper degree of thickness and firmness. Every yard of cloth wove from yarn completely equal, with square interstices of the same dimensions, will shrink nearly the same precise number of inches in width and length. But when due attention is not paid to the preceding requisites,—when the wool is not all of the same fineness,—when the yarn is uneven, or of a different size or twist,—or when the weaver neglects to fasten broken threads, or to propel the woof with a steady hand,—in any of these circumstances, the mill cannot perform its office aright, and there must be defects and inequalities in the cloth, which care and skill may conceal or lessen, but cannot entirely remedy. Besides strictly observing all these directions, an experienced waulker‡ will constantly and narrowly watch the mill while at work, that the cloth may be regularly supplied with the proper quantity of prepared moisture, and arrive at the precise consistency that is wanted. When a well-wrought web is put into the mill, every intelligent manufacturer knows to a mere trifle how much it should lose in length and breadth from the operation judiciously conducted, and consequently the quantity and width of what remains. It is scarcely necessary to add, that he must allow more or less time according to the slowness or quickness of the motion, and the nature of the wool. For, as has already been observed, some kinds are sooner and more easily compressed and thickened than others.

* The lay is that part of the loom which pushes forward the woof, and upon the top of which the shuttle runs.

† Stale urine.

‡ The waulker superintends and directs the fulling-mill.

Upon coming out of the mill in this moist state, webs are first coarsely brushed with a kind of cards, and next tightly stretched upon tenters with hooks till they dry and receive a second brushing. In this extended state the smallest blemish may be perceived, and removed; and the pieces are either thrown a second time into the mill, or subjected to the shears as their case may require. Among all the improvements in the machinery for manufacturing woollen cloth, none is more simple and useful than that of moving the shears by water or steam, instead of the hand. Several pairs of shears cropping cloth without any visible agent, and stopping of their own accord when they reach the selvage, has so much the appearance of magic, that in the dark ages of our ancestors it might have passed for a miracle, if exhibited by a Catholic priest,—and subjected any other man or woman to trial and condemnation for witchcraft. In this way, one man, with less fatigue, and to better purpose, can do fully as much work, in the same time, as four of the best croppers in the kingdom.

There are machines of different constructions for raising the piles, by which, such as have escaped the first cropping, are detected and exposed to a second, and the operations of brushing or raising, and of cropping, may be alternately repeated, till the pile becomes sufficiently bare and smooth, and the cloth receives a polish that will stand the nicest examination both of the sight and touch.

For this purpose, cloth must be pressed; and the most approved presses are large and strong, with plates all heated to the same exact degree in an oven, which being placed at the same precise distance from each other among the folds, diffuse an equal heat through every piece. When the cropping operation is finished, and the cloth comes from the press, it should be replaced there; and the position of the plates should be once or twice shifted; always observing, in renewing their heat, to delete the marks they leave in the folds, and to give an uniform gloss to the whole piece.

It is unnecessary to bestow the same minute care and pains upon coarse cloth, because, from its nature, it must soon lose all traces of the shears and press, and acquire something of a rough shaggy appearance. Being, however, an article of the first necessity to the poorer classes in every community, and, in that view, of considerable importance to the public, it should be manufactured, though not in a polished, yet in a substantial manner. The wool, as nearly as possible, should be of the same coarseness and well cleaned; the yarn should be equally spun and wove; the web firmly milled, thoroughly scrubbed and

brushed; the cloth carefully freed from the coarsest piles; neatly, but not too barely cropped, and hard pressed, that it may be durable and thrifty, though cumbrous upon the back, and not seemly to the eye.

Having thus traced the management of wool from its growth upon the sheep, through every stage of its progress into cloth for the use of man, I take the liberty of submitting the following reflections and advices to the serious consideration of those different classes who are chiefly interested in the subject.

Let me begin with addressing the farmers who are the growers of wool, that fertile source of national industry and wealth, and with whom must originate every radical improvement in its quality and management. Many of you, gentlemen, have the merit of gradually introducing a total or a partial change in the breed of sheep, by which their wool is essentially meliorated in fineness and closeness of pile. Nor are ye inattentive to the proper treatment of it. Your *smearers* * and *clippers*, in general, are much more careful and expert, than they were twenty years ago. Yet this is only *generally*, not *universally* the case. Ye are not ignorant, that both these operations are by many performed in a clumsy, superficial and incomplete manner. Nor can ye deny, that ye are *all* more or less deficient in selecting and preparing proper tar and butter for salve; † that some of you cannot be vindicated from the charge of being careless, slovenly and wasteful in laying it on, and that others wilfully suffer much filth to remain upon the fleeces, which, in washing, clipping, and rolling them up, might be removed with very little trouble. Now, gentlemen, how easy is it for you, who guard against such practices, to embrace every opportunity of reprobating them in others? Let them be the constant subject of your warm and strong disapprobation, and vehement censure, when ye meet together and converse at fairs, markets, roups, clubs, weddings, and especially at *shews* of cattle or sheep. Represent, in pointed and severe terms, that such mean and unworthy practices, which are utterly repugnant to the fair character of a British merchant, are not less disgraceful to the character of a British storemaster, and materially hurtful to the sale of wool, his staple commodity.

Could I suppose that staplers would take the trouble of read-

* *Clippers* are those who clip, and *smearers* those who smear.

† Since I wrote the former part of this paper, I understand with pleasure, that several intelligent and experienced growers of the best Cheviot wool, have of late mixed sweet milk with their salve of tar and butter, at the rate of a Scotch pint to every 8 or 10 lib. of butter, and find it contributes to make the wool fairer and softer to the touch.

ing this paper, I would with the same freedom, and in the same spirit, reprehend some of their practices. It is well known that they make the mismanagement of one or a few packs of wool, a pretence for beating down the price of others, which they have no reason to suspect of the same fault. It is likewise well known, that some of them are in the habit of setting off their dark and dungy wool, by a mixture of clean and fair wool of the same fineness, for which they sometimes give a higher price than the selling average. Surely their own hearts will tell them, that such artifices are unworthy of fair dealers, and very prejudicial to the woollen manufacture. Did they ever know or hear of a single stapler enriching himself, or gaining respectability by having recourse to them? Are not purchasers encouraged to employ against them the same arts, which they employ against the growers, and to decline offering the real value for good wool, because they had been formerly imposed upon by a mixture of trash? Their interest and their honour should teach them to abandon practices so destructive to both.

The manufacturers in Scotland, who are their own staplers, I would beseech to be very careful in assorting their wool; to make into cloth only what is precisely of the same quality, whether fine or coarse; and either to sell the remainder to others, or purchase from them what will incorporate with it into equal, neat and firm cloth. Let such of them, as are employed in working up the wool of others, resolutely remonstrate against receiving a few fleeces, or a small parcel of wool of different degrees of fineness, from the well grounded apprehension, that they may incur unmerited reproach for not making equal and fine cloth, when the fault lies in the limited quantity and unequal pile of the wool. In other respects our manufacturers need no incitement to industry and excellence. When able to procure a plentiful store of wool, they are sufficiently skilful and diligent in assorting and manufacturing it.

Both in this and in my former communication, there are technical provincial expressions, which may not be intelligible to English readers, though I have endeavoured to explain such of them as I discovered. It may be proper to add, that the terms 'brushing,' 'raising,' and 'scrubbing,' are used promiscuously to denote those operations by which coarse piles are removed; and *all* piles are presented in an erect form, so as to be easily caught by the shears. Under the general names too of 'brushes' and 'cards' are comprehended, whatever brushes or raises cloth, whether made of hair, wires, or teasles.

I am, &c.

12th October, 1818. G.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Account of the Second Trial of a Reaping Machine, before a Committee of the Dalkeith Farming Club.

SIR,

As the public curiosity has been a good deal excited, by the attempts that have lately been made to invent a machine for reaping corn; and as the accounts given in the newspapers of the trial of one that took place on the 3d September last, in presence of a Committee of the Dalkeith Farming Club, have been grossly misrepresented, I feel it my duty, as a Member of the Club, to give you a detail of what actually was the result of the trial, and on which the Report of the Committee was founded.

And here I take the liberty to premise, that the observations I shall make do not proceed from the most distant intention of detracting from the merits and abilities of Mr Smith the inventor, a gentleman for whom I have the highest respect, and whose character for ingenuity, and diligent application to the duties of his profession, is too well established to require any encomium of mine; but merely to correct the wrong impressions which may arise from a perusal of the garbled descriptions which have appeared in different newspapers, of the manner in which his machine operated.

That the machine performed the work in a satisfactory manner—and, as was asserted in the Edinburgh Evening Courant, that 'on comparing what was done by the machine, with another field in the neighbourhood cut down with the sickle, the 'stubble left by the former was uniformly shorter, and the corn 'laid down more regularly, than when done by the hand,'—are positions which will not be admitted by any unprejudiced person who was present, and who was competent to judge of the work; there is, therefore, good reason for supposing that the writer of the paragraph inserted in the Courant, is not qualified, from experience, to give an opinion on the subject.

I am far from calling in question the authority of the literati, the mathematicians, the antiquarians, the members of the Edinburgh Institute, &c. &c. who attended on the occasion, in matters relating to their respective studies; and, on a subject which would require deep research and laborious investigation, it would certainly be presumptuous in me to enter the lists with any one of these sages; but, when the question is, simply, whether or not a field of corn is cut in a proper and husbandman-like manner, I humbly apprehend, that as much weight should be due to the opinion of one who has had experience of country affairs for up-

wards of twenty years, as to that of one whose knowledge of those matters is merely theoretical.

The members of the Committee, and I may add, the majority of the members of the Club, (I say the majority, because in a society consisting of upwards of one hundred individuals, it may naturally enough be supposed that a difference of opinion will prevail) were much disappointed by the issue of the trial. From the specimen shown last year at the trial of Mr Smith's machine, the strongest hopes were entertained, that the alterations and improvements which had been made would answer the end; and that this great desideratum in the rural art would, in a short time, be attained in a perfect form. Instead, however, of the work being performed more correctly, the execution was much inferior to what it was last year, the corn being so imperfectly cut, and the stubble left so very long, that unless people were employed to go over the ground again with sickles, to take up the straggled corn, and to crop the stubble, it could by no means stand the test of *rural criticism.* In fact, it was greatly worse than ever was seen in the days when *kemping* was in fashion; a practice now most justly and universally exploded, in every district where modern husbandry is understood and properly practised.

The machine was impelled by two horses, in place of one, as formerly; and was directed by one man, while the horses were guided by another. Both men and horses appeared to be fully employed; and it was even doubtful if they could have continued at the same rate for the usual space of half a day's journey; but this was not ascertained, as, after being at work for one hour and a half, the man who directed the machine having reversed the motion too rapidly, one of the pinions gave way, and consequently put a stop to the trial for that day. During the above time, the quantity of oats cut amounted to two roods and twenty-six falls, Scots measure. It will be admitted, that the corn was laid down more regularly than it was at the former trial.

I must confess, Sir, that I am one of those who have been all along none of the most sanguine in the expectation, that a machine will be invented to be generally employed in reaping corn; and the result of this trial has in some measure tended to strengthen my doubts on the subject. In certain favourable situations, that is to say, where the ground is perfectly or nearly level, and where the corn is not lodged, it may be possible to operate upon it by machinery; but in different circumstances, it will be quite impracticable. Had any person taken an attentive survey of the country at the approach of last harvest, he would have seen, that few fields were suitable for being cut down by a machine;

as, owing to the unevenness of the face of the country in general, or to the nature of the soil, which, in many instances, renders it necessary to form the ridges with a certain slope, the greatest proportion of the land in tillage is much too uneven for the purpose; and, besides, the weather was so genial through the course of the summer, that the crops were very much lodged, and in many instances lay as close to the ground as if a roller had gone over them. If, then, the result of the trial was unsatisfactory, although the field on which it was made was well suited for the purpose, may it not be inferred, that matters would have been still worse in different circumstances?

What I have here advanced, are the sentiments of several gentlemen and farmers with whom I have conversed on the subject, whose opinions, were I at liberty to give their names, would justly be entitled to respect. Although these sentiments do not accord with the accounts which have been already given to the public, yet I am confident there is one point on which both parties will most cordially agree, and that is, in the tribute which the writers of these accounts so handsomely pay to Mr Smith; and I sincerely hope, that the Club will embrace the earliest opportunity of testifying the sense they entertain of that gentleman's talents and abilities. I am, Sir,

Your obedient humble servant,

1*st October*, 1813. AN AGRICULTURIST.

*** The preceding communication cannot fail to excite feelings of regret and disappointment in many of our readers. Though it might be evident, from the first, that no machine could ever be constructed which should operate upon a rough or unequal surface, or upon grain lodged by heavy rains, or twisted by high winds, yet it would certainly be a most important acquisition, if machinery could be applied to that portion of the crop of which the circumstances are more favourable. The saving of expense by the use of a machine, if considerable, would render it the interest of farmers to prepare the surface for it; and where that could not be done, or where a part of the crop was lodged, recourse would still be had to the use of sickles. Yet if only a third or a fourth part of the crop could be cut by machinery, the advantages would certainly be very great, not only by the difference in the expense between manual labour and machinery, but perhaps even still more by the difference in point of expedition. For a week or two in harvest, the object is not so much to save the wages of labour, as to have the labour performed, cost what it may, at the proper season.

The disappointment must now be the greater, as 'the strong-

'est hopes were entertained' from the trial of last year. We wish our correspondent had assigned the reason why 'the exe-'cution was much inferior to what it was last year,' especially as it is 'admitted that the corn was laid down more regularly;' and also why the machine was not repaired, and the trial repeated. The opportunities and respectability of the writer do not permit us to entertain any doubts of what he has stated; yet some further information would have been desireable. About the merits of Mr Smith, it seems impossible that there can be any dispute; and we shall be glad to learn, that he has been handsomely rewarded for his interesting exertions, even though they should not be ultimately successful.—*Con.*

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Distance at which Trees should be Planted, in Reply to A. S. (No. LV. p. 302).

SIR,

My attention having been excited by the communication of A. S., contained in your last Number, on the subject of Planting Trees, I cannot refrain from offering some observations thereon—not, however, with a design to present your readers with full and perfect answers to the queries therein proposed for disquisition; upon which, as A. S. has dwelt at some length, it would have been unnecessary for me to publish any opinion on the subject, had his doctrine regarding the distance to be observed between young trees, in forming a plantation, not appeared to me to be grounded in error; and it is for this reason alone, that I feel solicitous to make a few remarks on that part of the communication before alluded to.

Having assisted for a considerable number of years in the management of an estate in this part of the kingdom, where planting has formed a prominent feature in its improvement; great part of it being high, rocky, and consequently barren, moor and waste land, is adapted to no other species of cultivation; and has therefore been laudably devoted to this valuable purpose. Larch, Scotch fir, and Beech, have been selected in preference to any other description of forest trees; and from 60,000 to 100,000 of these having been annually planted under my superintendance, I consider myself entitled to speak from experience on the comparative merits of thin and thick planting. The nature and quality of the soil, on which the numerous plantations in this neighbourhood have been raised, being pretty uniform,

and composed of a rough, sandy, and in general shallow, gravel upon grit-stone rock, with a covering of black soil, resembling moss earth, but varying in thickness, I have not acquired that knowledge of the properties of various soils, to qualify me to say which is most suitable to each species of forest trees; and for this cause, do not mean to enter on that division of the subject. But for the information of A. S., I shall observe, that on the soil I have described, Larch and Scotch fir, more especially the former, thrive admirably well, (as do also Beech, where the climate is not too severe), except where the black earth is of such thickness, as to prevent the roots of the plants from striking into the gravel; for wherever that is the case, the plants soon languish, and die.

With reference, then, to distance:—Although I am disposed to censure very thick planting as much as A. S. can do, I still am of opinion, that it is equally pernicious and fatal to fall into the opposite extreme, and leave the plantation too open, and consequently too much exposed to the injurious effects of high and boisterous winds. It is not, however, possible to establish any given distance as a regular standard to be alike observed, without discrimination, in all situations. The distance between the plants ought to vary, as the situation and peculiar circumstances of the ground to be planted, vary. For instance, it might be prudent, when forming a plantation on land already sheltered and screened from winds, to leave the plants eight feet apart; but it would be absurd to observe the same rule, when planting on exposed and elevated ground, where two very material objects to the planter, are, to dispose his plants, so as to enable them to shelter each other, and at the same time to ensure a free circulation of air through his plantation; for notwithstanding the confident assertion of A. S. to the contrary, it is a fact established beyond the possibility of a doubt, that plants will yield each other succour and shelter, even in the earliest stages of their growth. On the very exposed situations, which have recently been planted in this neighbourhood, the trees have been placed from four to five feet asunder, or at the rate of something more than 3000 to the acre (statute), which distance has been found to succeed well—at the same time affording sufficient protection to the plants, and securing to them the benefit of the air.

At a former period, it had been the practice on the same estate to plant double that number, even on ground situated much lower, and consequently less exposed to the effects of a severe climate. The air being thus excluded from the interior of the plantation, the trees were, in consequence of this privation, be-

ginning to pine, and would no doubt have suffered considerably, had not relief been afforded as soon as this was discovered, by regular and gradual thinnings, by which means the plantations have been restored to a vigorous and healthy state. Notwithstanding A. S. has been pleased to say, that the expense attending such thinnings frequently exceeds the original cost of planting, I can safely aver, that so far from this having been the case here, the proprietor has, besides the restoration of his plantations, been amply remunerated for his trouble, in the sale of the weedings; the better sort of which, for the purpose of railing, having been sold after the rate of from 7s. to 10s. per score; while the inferior kind have fetched from 6s. to 20s. a cart load. I mention these circumstances, with a view of demonstrating, that the ill effects of thick planting may be remedied with the aid of a slight degree of attention and trouble in the early progress of the plants; and that the planter need not be deterred from thinning his plantations, through the dread of incurring a great additional expense, as seems to be the apprehension of A. S. After all, I cannot however but admit, that the thinnings to which I have above alluded, did not take place at the most proper time—it would indubitably have been better, had the plantations undergone the operation several years earlier. But the most seasonable time having been suffered to go by, was not deemed a sufficient reason to prevent the thinnings from commencing when they did; which having been proceeded in gradually, and conducted with great care and attention, have produced the desired effect.

Supposing the thinning of a plantation to take place at the period, when it should first require it, which I apprehend, in our climate, would be about ten years after the planting: in that case, it cannot be expected, that the sale of the weedings would defray the cost of labour in cutting them out; although in this neighbourhood, by reason of its proximity to a populous manufacturing district, the sale of the young trees cut out, even in that stage of their growth, has always proved adequate to the expense in labour. This, I am willing to allow, is an advantage purely local, and consequently cannot fairly be taken into account, in a general view of the subject; but it may be remarked, that although the weedings of a plantation may at first produce nothing: still, when the operation of thinning shall be repeated, in the lapse of a few years, they will be grown to some value, and in process of time, will in their produce more than amply repay the planter for any trouble and expense which may have attended these operations. Another advantage accruing from planting moderately thick, is, that the young trees will then prevent each other from sending forth too many

lateral branches, and by this means, render unnecessary the use of the pruning knife; and in consequence, prevent much of a similar kind of mischief and injury to that which has generally arisen to plantations, from this implement being entrusted in inexperienced and unskilful hands, as has but too frequently been the case, since Mr Pontey's treatise on forest pruning, first appeared before the public.

From what I have here advanced, it will be seen, that I am not an advocate for very thin planting; and in this opinion I am confirmed, from feeling a thorough conviction that its consequences are far from being beneficial to the planter; from knowing, that the expense attending the weeding of plantations, is almost immediately repaid to the proprietor, in the produce of the young trees cut out; and also from being well aware, that it is utterly impossible to convert a plantation into timber trees, without being at some cost and trouble in thinning, during the early growth of the plants. If A. S. conceives that he can raise a plantation, without being at any cost in thinning, and really imagines that he can effect it, by setting his plants at the *very original distance* of twelve feet apart, he will pardon me for informing him, that he is grossly deceiving himself. To scarcely any situation, howsoever protected, do I conceive such a distance between plants, as that suggested by A. S., to be applicable; but I feel no hesitation in asserting, that should he pursue this system on ground the least elevated or exposed, he will be merely sacrificing a quantity of plants to no purpose; it being impracticable, under such circumstances, to rear a plantation, so as to make it yield any profit to the planter, unless the plants are set much closer together, than the distance of twelve feet. The injury occasioned by planting too thin, will soon be visible, in the shoots of the young plants sent forth during the summer, dying for want of shelter, in the winter season. This evil, if perceived in time, may however be removed, by setting a number of additional plants among those already planted, so as to decrease the distance between them: But should this not be attended to at a period sufficiently early, the defect will not be remediable by any other means, than replanting the ground after a different and more judicious method.

In concluding these remarks, I wish it to be understood by A. S. and those who may honour them with their perusal, that the arguments here adduced in favour of planting moderately thick, are intended only to apply to situations similar to those whereon these observations are founded, and cannot in fairness be construed to relate to places possessing the advantages of a warmer soil and milder climate. M. E.

High Peak, Derbyshire, 5th Oct. 1813.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Soils adapted to different Sorts of Trees, and the Distance at which young Trees should be planted.

SIR,

IN your last number for August 1815, your correspondent A. S. solicits information on the following topics: 'Ist, What are the soils and situations adapted for different trees? 2d, At what distance from each other should young trees be planted?"

The first question, in its present form, is vastly indefinite; because apple, pear, cherry, plum, peach, nectarine, with all other common, and uncommon kinds of trees, are included; and this most obvious acceptation of the question, renders it very difficult to be answered;—perhaps it might afford matter for too great a portion of your very valuable Magazine.

If, however, he intends barely the kinds commonly planted for *timber* in this country, such as the common varieties of firs, elm, ash, oak, chesnut, beech, birch, sycamore, willow, poplar, with the walnut, &c.; then it assumes a more definite and less complicated form; and in the latter acceptation, I feel myself able, with little labour to answer, by recommending the perusal of Nicol's Planter's Kalendar, from page 49 to page 69 inclusive; where the subject of soils, adapted to the growth of forest trees, is largely handled.

But soils abstractly considered, are by no means a desideratum with the experienced planter. A soil may be in itself of a quality capable of producing to perfection a certain kind of tree; but, the contingencies of climate, exposure, and shelter, being absent in the degree required, he determines not to plant the kind which otherwise would have been proper.

It is very cogently observed by your correspondent, that 'in places exposed to the sea-breezes, the sycamore-maple, or plane-tree, and the aspen, will grow where few others can exist.' But there are many places exposed to the sea-breezes where the soil is of a quality fit to produce to perfection, far more valuable timber trees. And the opposite is also frequently observable. But, in respect to situations for plantations, see the above mentioned work, page 28, and onwards.

I shall now proceed to consider of the second question, namely, "At what distance from each other should young trees be planted?" Here I would ask, where are they to be planted? Does the nature of the soil, connected with the contingencies of shelter and climate, bespeak the situation of prime quality? or is it the reverse? Further, suppose I had the above questions answered to my satisfaction, I would have still others to put,

such as, Is it intended that the proposed plantation shall be managed, so as to produce the greatest quantity of timber, of the best quality, in the least time possible? Or, is it intended merely as a screen to hide some disagreeable object from a particular view? Or, are the trees intended for single ornamental plants about a place? These, and many more such questions occur, and require to be answered, before one could give an answer to the question with any degree of propriety; and I would rather be silent, than slapdash give an opinion, without knowing the circumstances of the case.

Ancient acts of parliament may be cited with great propriety, in matters of jurisprudence; because, in matters of mere right between man and man, one can hardly suppose a parliament so ignorant or absurd as to determine wrong. But, in relation to the arts, it would be marvellous indeed, if, at the very introduction of them, it should have been able, by its penetration, to supersede all future improvements,—and especially wonderful, if it should have known the best distances at which young trees should be planted from each other.

Yet, after all, the act, as quoted by A. S., may very probably be correct; for the clause brought forward may have allusion to the planting of trees for ornament: at any rate, the circumstances of the case not being stated, we are at a loss to form a correct judgment respecting its propriety or impropriety.

The case, however, is rather different in respect to the quotation from Millar's Gardener's Dictionary: he has in contemplation *spruce-fir trees*, planted principally for beauty and ornament, as single trees. A plantation for the purpose of *timber trees*, does not appear, in the present case, so much the object of his notice; otherwise, it is likely he would not have advised the distance of eighteen or twenty feet.

Your correspondent is wonderfully fond of thin planting. He says, 'in making a large wood or forest, the trees OUGHT to be planted *far* apart at first;' but it is difficult to determine the exact latitude he would allow to the word 'far;' because, at one place, he says that 'large, well grown trees, will touch one another at the distance of 20 or 30 feet;' and, at another place, he seems to think it a little inconsistent to plant (I suppose) forest trees only six feet apart, when '30 or 40 feet is allowed to a pear tree to spread on a wall.' But, let us suppose, by the word *far*, he means the medium of the distance above quoted, or 30 feet; and let us further suppose, a plantation has been made agreeably to his *advice* in this respect, that is, with 60 trees planted in each Scotch acre, or 900 square feet allowed to each new planted tree; and, further, that it is

'exposed to the sea-breezes;'—and few arguments will suffice to satisfy any one, that the expense of thinning, nay, even of cutting the *timber*, will be completely saved.

No one, however, would say so much if the trees had been planted in a very favourable soil and situation. In such circumstances, they might and would grow to stately single plants, which would be much better adapted for ornamenting a place, than their timber would be for mechanical purposes; because, in the progress of their growth, from the profusion of air on all sides, the branches would invite the juices of the plant, in directions as diversified as their forms. But the multiplied branches of a bushy tree, are of trifling value in the estimation of the mechanic; and, were they even to be of some use, the bole is, by them, rendered much less valuable to him than it otherwise might have been, from knots; to say nothing of the shaken and shattered state of the boles of many single trees, when they come to be sawn up for use.

If it is replied,—the branches should have been pruned off; then would the pruning have put them in nearly the same *form* in which they would have stood, had they been more closely planted, without affording them any of the advantages which trees derive from a proper share of shelter.

A. S. seems very much averse to thick planting, and even quotes celebrated authority against it. He says, 'a celebrated agricultural writer remarks, that as soon as a tree encounters generally with its roots the roots of others, it becomes weaker for want of sufficient nourishment.' Now, I understand that this same celebrated agricultural writer is brought forward by A. S. as saying what he never could mean; nay, A. S. himself brings forward an instance to disprove the possibility of the case. 'The only large artificial plantation of Scots fir,' says he, 'that I ever observed, which had arrived at a full size, is that of the Fir-hill of Colinton, in the county of Edinburgh, which was planted by the late Lord Colinton, I believe near a century ago; and the original distance of tree from tree, every way, is precisely eight feet.' Now, it is clear that these trees had suffered nothing from thick planting, for they 'had arrived at full size;' and, before they could have arrived at any tolerable size, no one in the least acquainted with the growth of trees would deny that their roots had generally encountered with the roots of their neighbours.

The roots of a Scots-fir tree, presently 20 years of age, which had been planted eight feet from its neighbour, are not confined within a circle of eight feet diameter, but have, ere that age, extended themselves to double that distance; and if, at the age

of 20 years, they will have done so, certainly before they arrive at the age of the trees in the Fir-hill at Colinton, they must have extended much farther, and consequently their roots must have 'encountered generally the roots of others.' Yet, under such circumstances, the fir trees in Colinton wood had arrived 'at a full size!'

The error is not, then, allowing the roots of trees to encounter one another, but permitting too many roots to feed upon the soil; and this can be easily prevented by timeous thinning.

Your correspondent further attempts to illustrate the absurdity of thick planting, by contrasting it with too thick turnips, in the following manner:—'But,' says he, 'if turnips are allowed to stand too thick on a field, every one knows they soon run up to spindles; and if once they acquire that tendency, it is in vain to think that, by thinning afterwards, they will ever turn out a good crop.' Now, every agriculturist will admit the fact here stated; and I am sure, no grower of timber will deny its application, even to the growth of that article: But while the agriculturist would admit the impropriety of allowing his turnips to *remain* too thick for a crop on his fields, I have never known one of them attempt to put in the seeds thin enough to prevent the future labour of thinning out the plants; nay, experience has universally taught them, that turnips, which rise pretty thick from the seeds, have their growth greatly promoted by their affording shelter to one another; and, if thinned in proper time, such turnip fields universally afford the best crops. And, just in the same manner, every experienced grower of timber knows, that it is necessary, when shelter is of importance, and when the object is merely to raise the greatest quantity of solid timber, in the least time possible, to plant pretty closely together, and gradually to thin them out, as good management would direct; otherwise (who would doubt it?) they will very soon exhibit the appearance so well depicted by A. S.

I cannot, however, help thinking, that the arguments brought forward by him against thick planting, would have applied with much greater propriety to the want of timeous and judicious thinning; and I would add pruning. My reasons for being of this opinion, may be gathered from the following quotation from his paper: 'Yet, even these, when too thickly planted, are at 'times totally destroyed by snow drifts, one tree being pressed on another, and the whole borne down at once. The 'common morbid symptoms of trees planted too closely on one 'another, is, the plantation grows thin at the ground; the trees 'in it, and particularly the firs, become naked of branches, 'and tufted at their tops. Also, they all grow too tall for their

'grossness. They languish for want of air and nourishment, 'grow stunted, and die.' That the gentleman meant from these words to reprehend the want of timeous thinning, I think, not one of your readers will doubt; for it would be uncharitable of them to think that he had only one set of words, which he applied alike to thick planting, or want of thinning, though I fear, it would be difficult to defend him in the above case from this *sinless* infirmity. But however this may be, I affirm that the trees above alluded to, could not have been in such a state, even though they had been sown as thick as turnips generally are, if they had been judiciously and timeously thinned out.

Nevertheless, being from experience decidedly a friend to *thick* planting, and also a nurseryman, I would by no means wish to be confounded with those nurserymen of A. S.'s acquaintance, who he tells us, indiscriminately 'recommend plant-'ing from 6000 to 8000 trees on the acre.' The last mentioned number will very rarely be required, except in such a case as noticed in Nicol's Planter's Kalendar, pages 29, 31, 35; but more frequently the half of the former will be sufficient, when the soil and situation are favourable, even when timber is the object. How then your correspondent came to write, and cause to be printed, that 'nurserymen recommend planting 'from 6000 to 8000 on the acre,' I cannot account for, otherwise than by supposing, that he either owns, or was conversing with them, about some very wretched soil and situation, in contemplation for planting; or else, that he has got acquainted with some persons, who lately have changed their former occupation for one to which they are utter strangers.

But yet, by way of consolation, and especially to show them that I have a fellow feeling when nurserymen are attacked, by your indulgence I shall make a few remarks on the following very remarkable paragraph of A. S.'s paper; he says 'nursery-'men recommend planting from 6000 to 8000 trees on the 'acre, which makes the plants stand MUCH nearer each other 'than turnips ought to be allowed to grow.' Now, it will be obvious to every one, that 8000 turnips on an acre, allows about $6\frac{1}{4}$ square feet for each turnip, and 6000 allows 9 square feet for each turnip; but if we allow any considerable latitude to the word *much*, which he uses, perhaps it would not be unreasonable to suppose that he contemplated 11 or 12 square feet as a space sufficiently small for his turnips; and even after all this, he is terribly afraid that they are too thick, and will grow up to spindles!

Now, Mr Conductor, the best farmers I have known, think that if each of their turnips have a space of little more than

two square feet, it is quite sufficient for them to arrive at a capital size; but if this is the case, it would be very easy to show, that an acre would not be overstocked, if, instead of 6000, or 8000, no fewer than 26,000 or 27,000 were growing upon it. Perhaps when A.S. wrote his paper he did not advert to these *trifling* circumstances. E. S.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Answers to 'Questions regarding Grass Lands and Live Stock,' so far as they relate to the Dairy. By Mr AITON, *Strathaven.*

SIR,

As the inquiries, instituted by the Board of Agriculture, and repeated with some variations in your last Number, p. 361, seem to me to be well directed, on a subject of considerable importance; and as I had the honour to be the first, and, so far as I yet know, the only person that has stated any thing to the Board, or to the public, through your Magazine, on the subject of the West country or Scots dairy husbandry; I shall endeavour to answer, as I can, these Queries, so far as they regard that interesting subject.

Question I. 'What is the soil, and what the age of pasture, best adapted to a dairy stock?'

Answer.—I do not know that proper experiments have ever been made to ascertain the comparative value of old and new pasture, in feeding a dairy stock. The old turfs, so much valued in England, are scarcely known in the dairy districts of Scotland.

My opinion on this subject is, that though the milk of cows fed on rich old turf will yield more and better butter, yet those that are fed on new pasture, where the artificial grasses prevail, will, if all things are equally favourable, yield by far the greatest quantity of milk, and upon the whole make the best return from any given space of land. A dairy cow is fonder of a full supply, than that which is scanty, though of better quality.

Question II.—'What is the produce in milk, in butter, and in cheese, per cow, for the summer's grass only?'

Answer.—Perhaps the best of these cows, when well fed, may yield, on an average, about 12 Scots pints per day for 10 or 12 weeks, when in their best condition; and from 6 to 8 pints per day for the next 10 or 12 weeks; and about 3 or 4 pints per

day for three months more, or so; or from 1800 to 2100 Scots pints *per annum*. *

As to the quality of the milk, there is still greater difficulty to speak with precision. From my own experience and observation, corroborated by the generality of the accounts I obtained in Ayrshire, when I surveyed that county for the Board, I am of opinion, that from seven to eight Scots pints of milk will generally yield one pound Ayrshire weight (24 oz.) of butter, and which sells in single pounds, fresh, at from 1s. 8d. to 2s. per pound in towns, and from 1*l.* 3*s.* to 1*l.* 5*s.* per stone of 16 pounds of the same weight when salted. I am equally confident, that from 50 to 55 Scots pints of that milk will yield an Ayrshire stone of full milk cheese (24 oz. per pound and 16 pounds per stone) and which now sells at from 12s. to 14s. per stone.

Question III.—'What extent of pasture is required for a cow?'

Answer.—The diversity of the quality of the pasture, as well as of the size of the cows, and of the season, are so great as to render it impossible to speak with precision. One acre of some ground yields more food than two, four, six, or eight acres of others, on which dairy cows are pastured. Pasture is doubly productive some years compared with others. A large full fed dairy cow will eat much more food than a small one. Some feed their dairy stock, in part at least, in the byre, &c. On this subject it may suffice to say, that a dairy cow well fed, will consume probably about one fifth or one sixth more than the same cow when yell and put on pasture to fatten for the butcher.

Question IV.—'What kinds of food are required for winter, and what extent of land for producing it?'

Answer.—The food of dairy stock in winter is oat-straw and hay, with a very small quantity of turnip, to keep the cows from being dried up, and some boiled chaff with weak oats, potatoes, &c. in the spring, after they have dropped their calves. Mr Ralston estimates (No. LII. p. 481.) the straw at one stone, and the turnips at five stones; the hay at one stone English, and the potatoes at 36 pound per cow per day, which he values in whole at 5*l.* 19s. 8d. But many others do not give their cows such large quantities of turnip or potatoes as he mentions.

Question V.—'What is the additional produce per cow in winter?'

* This includes the produce both in summer and winter. The object of the query was to ascertain the produce from grass only; and this distinction was desired, for the purpose of ascertaining the comparative advantages of consuming grass by dairy cows, or by fattening cattle.—*Con.*

Answer.—The produce of a dairy cow, during the winter and spring, will depend much on the time she drops her calf. Dairy farmers wish their cows to calve from the end of March to the middle of May; but some of them calve at other periods. If a cow calve about Martinmas, her produce in winter and spring will be more than during the summer and harvest; but if she calve in May, her produce in winter will be small, and she will scarcely give any thing in spring. I have rated the produce of a cow, from the sixth to the ninth month after calving, at from three to four pints of milk per day. Some will give a pint or two per day during the tenth month after calving.

Question VI.—'What is the value of the whole produce of a cow for a year?'

Answer.—That will vary according to the manner in which she is fed—the quantity of milk she yields—the uses to which it is turned, and the state of the markets. Taking the produce of a first rate and highly fed dairy cow, at 2000 Scots pints; and supposing it is sold at 6d. per pint as it comes from the cow, the usual price in large towns, the total return would be 50*l.* If every 55 pints give a stone of cheese, and that bring, say 12s. per stone, the value of the produce in cheese would be nearly 21*l.* 17s., to which 30s. or 40s. may be added, as that of the calf and pork raised from the whey. If the whole milk is churned, and a pound of butter obtained from every 8 pints; that, at 1s. 8d. per pound, and the sour milk at 1d. per pint, amounts to 29*l.* 3s. 4d. Milk is bought by one farmer from another, within ten miles or so of Glasgow, at 3½d., and sometimes at 4d. per pint, to be churned, and the sour milk and butter sold in Glasgow. At that rate, 2000 pints will give 33*l.* 6s. 8d. Milk will bring more than 4d. per pint, when used in feeding veal in either winter or spring. It will be attended to, that these are given as the greatest returns in milk; that the milk is understood to be of good quality, and that it is rated at the highest prices. These are no more, however, than have been realized in many instances. Where the cows yield a smaller quantity—where the quality is inferior—or the prices are lower, a corresponding deduction falls to be made. *

* The object of this query, was to ascertain, not the value of the produce of a single cow, but the average produce per cow of a well managed dairy. The best dairies of Edinburgh and Glasgow do not average more than from 5 to 7 pints per day through the year for each cow, though the best milkers are purchased every year; and they are fed at three times the expense that has been stated. As they are not allowed to bring calves, but are sold fat, they are not dry for two months, or more, every year, as is the case with cows kept in the country.—*Con.*

Question VII.—'What is the value of the food?'

Answer.—On this subject, I shall again refer to the statements of Mr James Ralston, in your LII. No. p. 480.

If I were to offer remarks on Mr Ralston's calculations, I would say that I think he has overrated the quantity of turnip and potatoes, as few dairy cows get so large supplies of these; but the expense of management, risk, &c. seems to me to be underrated. When the prices of the winter provisions are taken at the current rates, I think 2*l.* or so, as the value of the dung, falls to be added to the produce.

Questions VIII, IX, X, and XI—regard the comparative advantage of soiling and feeding cattle on pasture. To these, I would

Answer.—Though there is certainly a great saving of food and increase of dung, by soiling or feeding dairy cows, as well as horses, on cut grass, in their stalls; and though the cows, when so fed on tares, clover, &c. will yield as much milk as when they are supplied with abundance of good pasture; yet I think the health and vigour of the cows would be promoted, and their returns increased, by being supplied with, say one-third, or one-fourth of their food, in pasture, and the rest in the byre. The quantity of land that would supply a cow in green food used in soiling, must depend on the quality of the soil, and other circumstances. All that seems to me necessary is to state, that I conceive the land that would feed three cows in pasture, will feed five that are soiled. There are vast ranges of pasture of an inferior or medium quality, that will support a dairy stock, but is not fit to be cut for soiling. But wherever the herbage grows so luxuriant as to meet the scythe, by far the greatest part ought to be soiled, either for horses or a dairy stock.

Question XII.—'What soils and pastures are the best adapted for milk, for butter, and for cheese, respectively?'

Answer.—The soils that yield the largest quantity of grass of a medium quality, are the most proper for a dairy stock. Dairy cows are fonder of a full bite than any superior richness in the quality of the herbage. New pasture, and the artificial grasses yield most milk; that which is old gives the greatest quantity of butter, from the same quantity of milk. Moorish and wild ground yields the best butter; but the least cheese. The milk of some cows yield a larger portion of butter, and that of others more cheese. The milk of all cows yields the richest, and generally the greatest quantity of butter, in summer; and most cheese in harvest, in proportion to the milk given.

Question XIII.—'Whether is skim-milk cheese and butter, or sweet-milk cheese, most profitable?'

Answer.—It is of so little consequence which course be followed, that many who have tried both, are yet unable to say which is the most profitable. When the sweet milk cheese was first introduced, it sold high compared with the other, and that was preferred by those who could make that species of cheese. But of late, butter and common cheese have risen so much in price, that many have returned to that species of manufacture. When these come to be overstocked, more sweet-milk cheese will be made. These things always find their own level. I am, &c.

Strathaven, 27th Sept. 1813. WILL. AITON.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Agriculture of Devonshire.

SIR,

I SEND you a short account of the course of crops, and mode of agriculture, and some description of the county of Devon, if the same be worth a place in your useful publication.

The face of the country is generally hilly—the roads narrow and bad—the soil mostly of a red colour—the deeper the red the better the land. There is a great deal of rich land in the county; but it is generally unfavourable to the purposes of agriculture, from the fields being so steep as scarcely to admit a wheeled carriage upon them; and the old custom yet prevails, in many places, of carrying out their dung on horses' backs in panniers, and bringing back the hay and corn in trusses tied with ropes. Their method of fencing is also very disgusting to the eye of a stranger; they are banks of earth, raised pyramidally, beginning at six feet, and some as much as nine feet, at the base, and raised to five feet in height, and two feet broad at the top; and at the top they plant wood, which is cut every seven years for fuel, as there is none but sea-coal in Devonshire. The climate is so mild, that myrtles, and other tender shrubs will bear the winters in the gardens; and there are some near the sea-coast from six to eight feet high. The Aloe that flowers once in a century, is at present growing in a gentleman's garden, unsheltered by any covering, at the mouth of Salcomb harbour. The great length of sea-coast is also an advantage, affording an easy conveyance for the produce of the land, and yielding manure in sea-weed and sea-sand, the former of which is an excellent dressing. There is also plenty of lime, of good quality, found in Devonshire: But we must acknowledge that we are much behind the north in agricultural improvements; and it is partly for want of more encouragement on the

part of the landlords. The farms are often let by public auction, when the highest bidder is declared the tenant, (for it seldom happens that private offers of taking are made to the old tenant); the covenants are made at the time of the letting, which are often cramping when a tenant would improve: Indeed it can hardly be expected to be otherwise, when so many attorneys are land agents; men, who, from their profession, cannot possibly be so well acquainted with agriculture, and the necessary improvements thereof.

The course of crops are,—1. Wheat, with a dressing of lime or sea-sand; 2. Barley; 3. Barley, with a dressing of lime or dung; and then Clover and Rye-grass, which lies three years; one of which it is mown, and the others pastured; and some farmers give a dressing of dung on the grass. The land is generally broke from the grass about midsummer for Wheat, and is ploughed in single furrows of 2½ inches deep, so as just to cut the sward; it is then cross ploughed, about the same depth; after which it is worked by drag roller and harrows, so as to clear out the grass roots, which are then raked into heaps and burnt; the dressing, if lime, is 12 hogsheads per acre, or sea-sand, or sea-weed, according to the different leases. The land is ploughed only once more, and that for seed. The usual time of sowing is from the latter end of October until Christmas; in situations near the sea, it has been found not to answer well, sowing much before Christmas. The quantity of seed per acre is from 2 bushels to 2½. The barley crop has two ploughings; the quantity of seed is 4 bushels; and when a second crop of barley in the same course is allowed, there is a further dressing required generally. Most farmers are bound to a certain quantity of sea sand and lime by their leases per acre, over and above the manure arising from the farm courts. The above is the general course in the lower parts of the county, but in higher situations, oats are sown instead of barley; and some take a crop of broad-cast turnips before wheat, without any dressing, and no more ploughings than for the wheat. The orchards form an article of considerable profit to the farmer in good bearing years; and the cider made in the southern part is as good as any in England. This county has little tythe-free land in it; and the clergy are not behind those of other counties in demanding a high payment for their dues. The general rule is to make a rate per pound rent, and add to it the supposed king's and parochial taxes, which in the end amount to a round sum. There are seldom any tythes taken in kind. Every rise of rent furnishes a rise of tythe for the clergy; for they always take care to know the advanced rent. I am, &c.

Devonshire, Oct. 1813. A.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Planting of Potatoes.

SIR,

If you can spare an unoccupied corner of your useful Work, I trust what I am about to say may be serviceable to some gardeners like myself, who cultivate grounds thought too rich for potatoes.

Having often planted potatoes in my garden, the plants run so much to haulm, and grew so close, that usually I had no crop worth taking up. It consisted of clusters of very small potatoes. Wherefore, during these two years past, I have tried the American way of planting potatoes, by putting into the ground, in the end of April, middle-sized potatoes uncut, placed at the distance of two feet every way from each other; and thus I have raised great crops of very large potatoes, without any manure.

Furthermore, having last spring obtained a piece of a very large potato of the sort called *proliferous*, I wished to increase the produce of it for seed, and therefore cut it into as many parts as it had eyes, (and it had an eye in a hollow part in the heart of it, which I thought curious); and I placed the sets, eight in number, at the before mentioned great distance of two feet, or rather more, every way from each other. I took up the produce a few days since, consisting mostly of large potatoes; and, having measured them, they filled six lippies Linlithgow barley measure, or above 30 lib. avoirdupois weight.

17*th October*, 1813. A GARDENER.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Experiments in crossing the Lothian Cows with an Argyleshire Bull; and in Rearing Calves with Oil-cake, as a Substitute for Milk.

SIR,

THOUGH my experience in breeding cattle has been upon a very limited scale, and does not enable me to speak decisively of the comparative value of different breeds and crosses, yet, agreeable to your desire, you are welcome to make what use you may think proper of the following details, the substance of which has been already communicated to SIR JOHN SINCLAIR, Baronet. With regard to my method of rearing calves on oil-

cake, I may venture to speak more positively. I have found it not only a cheap, but a very healthy and nutritive substitute for milk.

There are about fifty acres of very inferior land on my farm, which, as my lease was near a close, I was obliged to have in grass for four years. As it was utterly unfit for fattening, I resolved to rear young cattle on it, and, of course, considered what description of stock would be most suitable for my situation. Besides this land, very little of the rest of the farm is calculated for growing turnip. I determined to try a cross betwixt the West Highlander, and the common cows of the district. Having procured a bull of the best description very near four years ago, he was put to two cows, the only ones at that advanced time of the season not in calf. The produce was, two quey calves, one dropt about the middle of the ensuing summer, and the other immediately before the harvest 1810. These had both calves by the time they were two years old; but as that was at least a year too early, and as they both promised to be good milkers, they were very soon allowed to go yell, in the expectation of favouring their after growth. Last summer, by the time they were three years old, each of these queys had another calf; but one of them having unfortunately lost the milk in one of her teats, she was allowed immediately to go dry, or yell, as we call it here, in expectation that she would be fattened off the grass; and I am happy to see that my expectations will not be disappointed; for as I hoped, by the cross, to get something of the size of the mother, with the aptitude to fatten of the real Argyleshire breed, so the cow in question has improved amazingly, being now very fat, although upon very indifferent pasture for a good part of the summer. The other young cow is a most beautiful animal, short-legged, heavy carcase, gives plenty of milk of the richest quality, and is as gentle in disposition as could be desired. In spring 1811 I had six calves of the cross breed, which, after being weaned, were sent to the inferior pasture noticed above: during the following winter, viz. 1811–1812, they had turnips sufficient to keep them in an improving state. The following summer, 1812, they were sent again to the poor pasture; but as they got into excellent condition, the one half of the small lot, being three queys, got full turnips last winter, when, by the time they were only *two years old*, they were *fine fat*, and accordingly sold to the North-Berwick butcher, a man well known in this neighbourhood for always having only the best of beef. The stots of the same lot got a few turnips last winter, and are now ready for the shambles. In spring 1812, I had seven calves of the

same cross, which were treated exactly as the above, so far as they have come; and perhaps there is not a lot of the same number in the neighbourhood, superior to these in beauty and condition. I do not mean to say that they are equal in size to the Berwickshire breed; but I am pretty confident that the cross breeds will get into good condition, where the Berwickshire or other larger kinds would be half-starved; and that upon inferior pastures, they will leave a far greater profit to the breeder, at lesat such has been decidedly the case with me.

It has often been urged against the Highland breed of cattle, as well as against the half-breeds, that from their fierce and wild dispositions, they are ill qualified for feeding in the straw-yards. To obviate that objection, which in some degree I believe to be well founded, I made it a particular rule to tie or bind the calves to the stake in the house during the first winter, allowing them to get out into the straw-yard during the day; by which means every one of them became as gentle and quiet as could be wished for.

I shall now state the way in which I rear my calves, before they are fit to live upon grass. A quantity of oil-cake (depending upon the number of calves) is broken into small pieces, and thrown into a tub, upon which boiling water is poured, (also according to the quantity required). The whole is then well stirred with a stick; and, when the liquor is sufficiently cooled, the hand may be used to squeeze the cake, the object being, to dissolve as much of the cake as the water will hold in solution; and this liquor we call *oil-cake tea.* When the greater number of the calves I have reared were about a week old, a small quantity of the above tea was added to their milk: In the course of ten days or so, by gradually lessening the quantity of milk, and increasing the tea, they came to have nothing but the tea, of which they were exceedingly fond; and, as a proof of its being very palateable, although every calf alluded to above was fed with it, not one of them upon any occasion ever refused it. And as a positive proof of its wholesome nature, and nutritious quality, I never had a calf that died in my life, but the whole throve to my utmost satisfaction. The calves were, in general, allowed as much of the liquor, when milk-warm, as they could take, which, the same as with milk, depends upon the age, size, or constitution of the animal. In general, they were weaned when about three months old; by which time they would lick up any crumbs of the cake that happened to be in the bottom of their dish with great avidity.

With the exception of new milk, oil-cake tea is certainly by far the best food that is ever used in the rearing of calves; at least as far as I am acquainted with the subject. For al-

though I have seen hay tea, linseed tea, &c. applied to that purpose, yet, from the great uncertainty of the quality of the liquor so prepared, it appears to me these can never be put in comparison with the former, which can readily be prepared by any servant upon the farm; the only care necessary being to have always plenty of broken cake in the bottom of the tub, the whole well stirred, and no more of the cake taken out than what the water holds in solution. The cheapness of the article is also a great recommendation to it, as one hundred weight is fully sufficient to rear three calves, which at 10s. or even 15s. per cwt., is only five shillings Sterling a head. I know that none of my stock cost me more; but, although it had been double, still it is very trifling, in comparison to rearing them with new milk.

East Lothian, September 1813. H. F.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Cultivation of Fruit-Trees in Scotland.

SIR,

I HAVE several times been extremely well pleased by seeing the notice you have taken of my communications in your valuable Magazine. At present, I mean to trouble you with the result of some little experience I have had for twelve years past in the culture of fruit-trees, a subject which your publication has very seldom touched upon. The bad character which various writers have given of the climate of Scotland, I own, created a sensation very difficult to remove, when I commenced my garden. We have been repeatedly told, and it has almost without opposition been assented to, that, in Scotland, a few of the smaller fruits, such as gooseberries, &c. may indeed be expected to come to perfection,—nay, even some kinds of apples and pears; but that this is the *ne plus ultra* of success to be expected from our climate. This opinion has had the sanction of Dr. Johnson's name, and even that of the best conducted critical review which this or any other country can boast of. I with regret observed, that it was assented 'that England might be said to produce grapes, just in the same way that Scotland might be said to produce apples.' This is the substance of the sentence, though perhaps not the precise words. This apparent consent of the Scotch, to the belief, or to the assertion, that the climate of the country is extremely unpropitious to the cultivation of fruit, is so much the more extraordinary, because we are universally

allowed to be not only extremely fond of our country, but likewise very jealous of any aspersion being cast upon it; and because we may be easily taken for competent judges, from the very extensive improvements carried on in every branch of agriculture, and even horticulture, in Scotland, and by Scotchmen in England and elsewhere. Another circumstance renders this idea somewhat distressing, which is, that however much the exertions of men may improve soil, we can hardly expect that much, if any thing, can be effected to make a bad climate good; which made some great agriculturist once exclaim, 'Give me climate, and I'll answer for it, that I'll make soil.' Indeed, except from the shelter derived from planting, I see no way of improving a bad climate in this part of the world. It is therefore highly proper that some person should vindicate the climate of Scotland from the erroneous opinions entertained of it by our Southern neighbours, as well as by some (if not many) among ourselves; and perhaps it will be at last allowed, that the distracted and impoverished state of the country for two hundred years from the middle of the sixteenth century, was a great cause of the decline of the cultivation of fruit-trees, as well as of many other arts, in Scotland. Before that period, both the nobility and the clergy seem to have been great and very judicious horticulturists, as is evinced by the remains of their gardens, and particularly by the careful preparation of the ground, by flagging or paving, and forcing warm, dry subsoils under the trees, which is of as much effect as a warm atmosphere in ripening fruit; not to mention the wise selection of such kinds of trees as answered best with the soil and climate of the country—many of which are still held in high repute; and the excellent choice of situations most conducive to success in rearing fruit-trees, and ripening the produce.

I shall conclude, without any more argument, by stating the kinds of wall-fruit which have, for six years past, yielded well, and ripened perfectly with me, taking the names from the list of Messrs Whitby and Brames, late of Old Brampton, near London, now of Fulham, who furnished the trees, viz. On a south wall—the Barrington,* Royal George, Royal Kensington, Vanguard, Noblesse, Avinthroides, and Millet Mignon peaches. The early Anne peach ripened likewise; but it is a poor fruit,

* Seven years after planting, I had about 40 dozen ripe peaches from each of two trees of this kind. I saw far inferior fruit, September 1812, selling in Covent Garden market, at 1s. and 1s. 6d. each. The juicy cling-stone kinds of peaches (of which this is one) are best; the mealy ones are of no value.

and therefore I threw it out; and the Feton de Venus, though it bore large beautiful fruit, did not ripen. The only kind of apricot I planted was the Moor Park, which bears largely, and ripens perfectly. Though, I believe, it is among the latest of the apricots, this year it ripened fruit 15th August.

All the kinds of nectarines I planted, were sent by Messrs Whitby & Brames, and they likewise have yielded well, and ripened most perfectly, large fine flavoured and beautiful fruit. Nonpareil golden pippin, Ribstone pippin, Lethinton pippin, and Golden rennets, have constantly ripened remarkably large fine fruit on a south wall. I have found no pears * answer in bearing, and ripening, and quality, equal with the Jargonel for summer use, and autumn Bergamot for winter use. Nor have I tried any plums, except the Green Gage: Those pears and plums ripen well upon eastern and western exposures. The cherries I have found the most advantageous, are the large White-heart, Fraser's tartarian, Ronald's cherry, Adam's crown, Mayduke, and Graphion; they ripen on any exposure, though not so well perhaps on a north wall. The apples I have found to answer best as standards or espaliers, are the Crofton, Lethinton, Oslin, Hawthornden, Summer Strawberry, Cats-head, Red and White Calville, Corpandu, Matchless Pearmain, Royal Pearmain, Summer Nostreak, Holland pippin, Russel's leathercoat, Janet Sinclair, but above all Wheeler's russet, which though not a great bearer, will probably be found the best winter eating apple of all. A great many other kinds have answered equally well. † Those who are very fond of gooseberries, will perhaps find the old Scotch sorts, such as the small hairy deep red, the small green, and small smooth yellow, far preferable in point of flavour to the new large kinds, which are often totally insipid, and the introduction of which I think far from an improvement.

I have furnished these remarks, partly because a climate which can bring such fruits as I have stated to perfection, cannot be esteemed ungenial; and perhaps persons planting gardens may

* I have had many other kinds, such as the pear D'Auch, the Virgaleuse, the Gansel, and Summer Bergamots, Cressane, Chaumentille, several Beuves, the Colmar, Wilding of Cassoy, Bonchretien, (which bear well, and will do for baking), &c.; but I had no satisfaction from them, either on a wall, or as espaliers. I mean to try the Doyen, or Dean's pear, as I have read a great character of it in some late publications.

† The above fruits, and others, have long been cultivated with success in the Culloden gardens at Dochfour and Drakie, the property of Lachlan MacIntosh of Raigmore, all in one parish.

avoid disappointment in adverting to the selection of fruit trees, as several circumstances are to be considered; particularly, as to what kinds are best to the taste; what kinds will ripen their fruit or not; and what sorts will bear fruit in sufficient quantity to answer expectation. I am, Sir, Your Constant Reader,

Inverness-shire, 8th Sept. 1813. D.

FOR THE FARMER'S MAGAZINE.

Method of Attracting Rats and Mice, and taking them alive.

Mr Broad, a farmer at Thruxton in Herefordshire, has at last published his method of destroying rats and mice; and as we understand that he has received a public reward for the discovery, there is every reason to suppose, that the means he has adopted are effectual. We therefore propose giving an abstract of the plan he has recommended, as any mode of destroying such pernicious vermin cannot be too generally made known.

The first object to be attended to is the trap, which differs but little from the common box-trap. The size most approved of by Mr Broad is two feet long, eight inches wide, and nine inches deep, inside measure. If it be either longer or more narrow, the rats will not enter it so freely; and if it be shorter, the danger of their escape after having entered, and of being struck by the falling doors, may be increased. In each door there is a grate, made of iron wire; for the old rats would soon destroy either brass or copper. This grate should be 4 inches wide; it is intended to attract the rats when taken to the light, and to prevent their injuring other parts of the trap with their teeth. The bridge upon which the rats tread, to occasion the falling of the doors, should be made of tin, or very thin iron plate, about 6 inches wide, and 4 broad, so as to extend nearly across the inside of the trap. And the neck of the bridge should be made of a light slender bar of iron, about two and a half inches long, so as to extend about two-thirds of an inch beyond the external surface of the side of the trap, for the purpose of setting it. A thin plate of iron or tin should be nailed upon the inside of the aperture through which the neck of the bridge passes, otherwise the rats will soon spoil the trap, by enlarging that passage. The end of the bridge opposite to the neck must be suspended about half an inch from the bottom or floor of the trap, by a single loop of iron wire attached to a hook fixed in the side of the trap; by which means the bridge,

being very loosely suspended, will move with the slightest pressure upon either side of it, and the trap will be made to strike by the weight of a small mouse.

The trap should be made of elm, birch, or poplar boards, which are without scent. The wood should be well seasoned, otherwise the boards will be subject to warp, and the doors, in consequence, will not fall perfectly.

As soon as the traps are prepared, the most proper and convenient places for setting them must be sought. These are either close to their holes, where every animal is less timid, or where they are known to come regularly for their food. Where a number of convenient and proper places for setting the traps can be had, it is advisable to set a considerable number of engines to work at once, so that much destruction may be made in a short time; for though, wherever proper attention is paid, every rat will be taken, still, when their number is for a long time slowly diminishing, the survivors grow suspicious; and it will sometimes require, in taking a hundred rats, more trouble to destroy the last five, than the preceding ninety-five. Few situations, however, require more than half a dozen of traps.

The materials for attracting rats are, *1st*, the oil of carraways; and *2d*, good pale malt, ground for brewing, and not discoloured in the drying.

The proportion of the oil of carraways to the malt appears to be about 1 to 9000.

Much care must be taken in preparing and setting the traps; and the most trifling deviation from the following instructions, will often destroy all chance of success. Be provided with as many ordinary trusses of sweet clean straw as you have traps, and take from each truss a small bundle, about as much, when compressed in the hand, as will make an inch in diameter. Then take a small vial bottle, the neck of which is about one-third of an inch wide, and which contains half an ounce of oil of carraways; invert the bottle upon the palm of your hand, and then return it to its former position, letting no more of its contents escape than that which has adhered to the hand, whilst the bottle has been inverted. Rub your hands then well together, and draw the straw through them, bending it so as to render it soft and flexible. Let it then be placed lengthways in the trap, and laid smoothly and evenly to cover the bridge, and every part of the floor of the trap, regularly. Then take five half-pints of the malt; place it in a large basin; invert the vial of the oil of carraways upon the palm of the hand, and take from it the quantity which adheres as already directed; rub the hands together so as to spread the oil of carraways regularly over them:

then take up successive portions of the malt in each hand, and subsequently, with both hands, rubbing it between them, that every part of it may be equally scented. Much accuracy is here necessary; for if the quantity of the oil of carraways be too great, the rats will not touch the malt till the scent is partly gone off.

Let about half a pint of the malt be thrown into each trap, by the hand of the person who has prepared it, scattering it rather regularly over every part of the floor. Place the traps then in the situation where they are to remain, and secure the doors from falling, by placing the pin just at the height they are to stand, when the traps are set. Divide each truss of straw into half a dozen parcels, and put a band round each; place two or three of these at each end of every trap, and sprinkle a few loose straws over each, so as in some degree to conceal the traps from the eyes of the rats. If the room contain any furniture, or trunk of any kind, let the traps be set behind it, if it stand near the holes by which the rats enter; or move the furniture, that it may partially conceal the traps; not so much, however, but that the person who attends to them may be able to see whether they have struck or not, without approaching very close to them. The morning is the most eligible time for this part of the process: And whenever the doors of the rooms in which the traps are set, can with convenience be kept locked, it should be done.

The following morning the traps may be looked at; and if the rats be in any degree numerous, the whole of the malt will generally be eaten, and the scented straw entirely taken away. These must be then prepared as before, and replaced according to the preceding directions, and the traps and trusses of straw must be left as exactly as possible in the order they were at first; for the rats are suspicious of the least innovation.

The floor of the traps must be kept constantly covered with a proper quantity of scented straw; for although the chief attraction to the rats appears to be the combination of the scent and taste of the oil of carraways with those of the malt; still they appear to be very highly gratified by the perfumed straw, and where they can be watched, they will be seen to move about it with much apparent pleasure.

After three portions of the prepared malt, which have been put into the traps, have been eaten in as many successive days, the rats will have acquired sufficient confidence to enter the traps without distrust, and catching them may then commence: but the traps must be previously baited again, and the straw, if wanted, be renewed; and every thing must be made to appear,

as nearly as possible, in the situation it was, before the traps were set. In baiting them, the hand of the person who has been preparing the malt, and which will, of course, be strongly scented, must alone be introduced into the traps.

The morning is generally the best time to commence catching, as the rats may be most conveniently taken out during the day; but if they have been harassed, and are in consequence shy, few, or perhaps none, will enter the traps till the approach of night. Where they are not accustomed to much noise of any kind, they are alarmed by it; but in great towns, where they are accustomed to noise of every kind, they are quite regardless of it.

To take the rats from the traps, a long and rather a slender bag, made of some thin material, which will admit a moderate quantity of light, must be provided; and into this the rats will be easily driven from the traps by introducing a slender stick through the wire grate at one end of the trap, and raising the door at the other end to which the bag is applied. During this, or any other operation, the hand must not, on any account, be introduced into the traps, unless it be previously scented; else no further success must be expected: even the part of the little stick which is introduced through the grate of the door, ought never to be touched with an unprepared hand.

Particular care must be taken not to hurt the rats in taking them from the traps; for their cries never fail to excite terror and distrust to all in the vicinity, and will generally prevent any more being taken within the succeeding twenty-four hours: it will therefore be proper to take the rats to some distance to destroy them. The greatest degree of precaution should also be used not to suffer a rat to escape after being taken, for animals have generally powers of conveying their apprehensions of danger to each other, though they do not seem at all capable of informing each other of the form or nature of the enemy, or the sort of danger apprehended.

The traps will require to have a small quantity of prepared malt thrown into them each day, and it will be necessary to renew the scented straw once in five or six days. It is always advantageous to take out the rats as soon as possible after the traps have struck; and therefore when the rats are numerous, and have entered the traps freely, it will not be eligible to let them remain set, when they are left for the night; because few rats only can be taken by the traps during the night, when they are not attended, and the remainder come more boldly into the traps the next day, if they have had full liberty to enter the traps during the preceding night with impunity, than if, during

the same period, they have seen one of their companions labouring in vain to break through the bars of his prison. But when the number remaining is small, and the destruction of a few rats comparatively important, the traps may remain set during the night; and it will not unfrequently happen that a rat, having been struck by the falling doors, or otherwise rendered suspicious, will not approach the trap till late in the night, when all is quiet.

If there be any cats about the house, or buildings, where it is proposed to take the rats by the preceding means, those should be previously confined, or taken away; for they will otherwise often approach, and sometimes enter, the traps; and when one is taken, it communicates a scent to the trap, which will render it wholly useless, till it has been exposed some time to the air, and re-scented. Dogs should also be prevented from approaching the traps; and no person, except those employed previously in baiting and setting them, should be permitted to touch them; for animals of many kinds probably distinguish individuals of the human species, from each other, by their scent and smell; and the rats, after part of their number have disappeared, will sometimes take alarm at a stranger; and it will on this and other accounts be desirable to select such places for the traps, wherever that is practicable, as can be secured by locks.

For the destruction of Mice, the following measures are recommended.

The trap to be used for that purpose, is similar in construction to those recommended for rats, but much smaller, being only 7½ inches long, 3½ inches wide, and 3½ inches high, inside measure. A dozen of these traps, if constantly set, and properly attended to, will be found fully adequate to keep a very extensive house and granaries wholly free from mice, and to diminish greatly their numbers in the barns of the farmer. For the latter purpose, however, traps capable of taking many at once, or of perpetually acting, might probably be invented, and employed with much advantage; for the mouse which frequents the barn is a very simple animal, and is very powerfully attracted by the ingredients, which will be recommended. As a bait for this and the longtailed field mouse, take about half an ounce of rich cheese, toast it moderately without burning it, and then put upon it, with a slender feather, or the point of the finger, a very small quantity of oil of carraways, one tenth of a grain will be sufficient for each trap. The bait thus prepared should be put upon the bridge of the trap whilst warm, and two small spikes should be there fixed to receive and hold it. When the traps are to be set in the garden, or forcing house, where the short-tailed field mouse often does much injury, it will be proper to place a piece of carrot under the scented cheese; for this

mouse, the only remaining mischievous species, is not fond of animal substances, though it appears as strongly attracted by oil of carraways, in combination with its favourite food, as any of its congeners. In buildings of every kind, the trap will succeed best if placed close against a wall, and at a small distance from the passages through which the mice are supposed to enter, as recommended for rats; but it will not be necessary to mask the trap at all, nor to bait it previously to being set.

In a case where so much precision is required, as in taking rats, the causes of failure are numerous: the oil of carraways may not have been good of its kind: the malt may not have been proper: and it is the scent of this substance, in combination with that of the oil of carraways, which appears to attract the rats. Even the quality of the straw is very important; for as the oil of carraways must be used in an exceedingly small quantity, it is easily overpowered. But the evidence which the author has adduced of his own success, he trusts, is unquestionable; and he has no doubt, that any person who attentively follows these directions, will not be disappointed.

The annual value of the crops of wheat and oats, alone, of the British European empire, cannot be less, the author observes, than 25 millions sterling; and of this, at least, one fiftieth part, upon the lowest calculation, is eaten or destroyed by rats and mice. The public loss therefore, in these articles alone, is at least 500,000*l.* per annum, exclusive of the damage done in ships, in storehouses, and buildings of every kind. The advantages to be derived therefore from the adoption of this plan, can hardly be sufficiently estimated.

Copy of a letter from T. A. Knight, Esq., of Downton Castle, to the Rev. J. Duncumb, Secretary to the Herefordshire Society.

DEAR SIR, *Downton Castle, Feb.* 18, 1812.

IN compliance with the wishes of the Agricultural Society of Herefordshire, Mr Broad of Thruxton has been here to afford me an opportunity of witnessing the very extraordinary powers which many respectable inhabitants of Herefordshire have stated him to possess, of attracting or taking rats; and I am happy in being able to inform you, that his success has been most complete, though he had to contend with more than ordinary difficulties. The rats in my house and premises were not very numerous; and they had been much harrassed, and many had been killed, and the remainder rendered shy and suspicious: and, as they had access to my scullery, kitchen, and stables, they were probably well supplied with food of various kinds. I imagined that under these circumstances they could only be taken at night; but Mr Broad desired me to appoint any hours of

the day which were most convenient to me; and by my appointment he commenced his operations about the middle of the day upon Thursday last, the 12th.

Five box traps, nearly of the ordinary construction, being set, were examined by me about two o'clock, and the five traps contained fifteen rats. These were taken out, and the traps in succession set again; and as soon as I had seen the rats killed, I returned again to the traps, when I found the falling doors of all down, and seven rats enclosed: Upon these being taken away, the traps were set again, and within less than 20 minutes nine more rats were taken; when the traps were removed to be baited again. During the succeeding 36 hours, the rats continued to enter the traps, though more slowly; and upon Saturday morning 59 rats had been taken. Mr Broad then returned home, leaving the traps properly baited, and informing me that he believed the extensive drains about my house and buildings still contained ten or a dozen rats, which would come to the traps; and, within the succeeding 24 hours, eight more rats, making in the whole 67, were taken. Subsequently not a single rat has been seen or heard about my house; and all my people agree with me in thinking, that not one remains alive here. Some of those destroyed were young; but much the greater part were very large and well fed, and apparently very old.

There appears to be no difficulty whatever in the management of the traps, or skill required to make them; and I cannot but give my opinion decisively, that, by the means Mr Broad employs, rats may be, under almost all circumstances, effectually destroyed in a very few days: and I believe this species of animal might be almost exterminated, for they appear to lose all their native sagacity, and to enter the traps with the blind stupidity of moles. I am, dear Sir, &c. &c.

THOMAS ANDREW KNIGHT.

FOR THE FARMER'S MAGAZINE.

Worked Oxen compared with Horses.

From the Agricultural Survey of West-Lothian, by JAMES TROTTER.

As to the question concerning the comparative advantages of employing horses and oxen in agricultural labour, the writer of this report can say little from his own observation or experience. Having applied to an intelligent farmer in one of the most fertile and best cultivated districts of Scotland, and who for many years has employed a proportion both of horses and oxen in the labour of a very extensive farm, he received from him the important communication on that subject which is subjoined to the following queries that were proposed to him.

Queries.

1. What number of oxen are required to perform as much work as two horses?

2. What are the respective ages of horses and oxen when first fit to be employed in the draught?

3. How many years do horses and oxen continue to be employed in the draught?

4. What may be the average prices respectively of a horse and of an ox when first fit for the draught?

5. Is an ox more or less valuable after being laid aside from work than when he began to be employed in it, and how much more or less on an average?

6. Is it suitable to employ oxen in any other branch of agricultural labour besides that of ploughing?

7. Is a driver, besides the ploughman, necessary to manage oxen employed in the plough?

8. Is the untractableness of oxen an objection of any importance to their being employed in the draught, and does not the prejudice of servants against using oxen in the draught lead them to exaggerate their untractableness?

9. Is one work-horse in twenty annually lost on an average by untimely death, or how many more or less? What proportion of worked oxen may be annually lost by untimely death; and are oxen more or less subject than horses to occasional distempers, and thereby to be rendered oftener, or not so often, unfit for their usual work?

10. Is the expense of feeding the number of oxen requisite to perform the same labour with that of two horses, greater or less than the expense of feeding two horses; and how much greater or less?

11. Supposing that it is at all proper to employ oxen in agricultural labour, what proportion may it be advisable to employ on a farm which requires ten teams to do the whole labour of it; and on a farm where not more than two or three teams are requisite, should any proportion of oxen be employed?

12. Be so good as to state any observations, not referred to in the queries, which may occur to you, respecting the advantage or disadvantage of employing oxen in agricultural labour.

Answers.

"I shall give you a frank and fair account of my manner of working oxen for upwards of twenty years, and of the way and expense of feeding them, and leave you to judge of the propriety of performing a part of farm-labour with them.

"From the first of October, or as soon as the harvest is over, until the end of May, to which time we now contrive to

make the Swedish turnips hold out, their constant food is straw, with a feed of turnips evening and morning. Hay they never taste, except a small quantity in the field, in winter, while the ploughman eats his dinner. In spring, they come home in the middle of the day, at the same time with the horses, and then they get a few turnips instead of the hay. With this feeding they keep in excellent condition, and are capable of doing a great deal of work. In the summer months they get cut grass in the shed, between yokings, or during the hours of rest at mid-day, and are turned into a pasture field through the night. They might certainly be kept at less expense, if constantly fed with cut grass; but I think they thrive better when allowed to go at large in the night time.

I shall take your queries in their order, as nearly as may be.

1. I hold three oxen equal to perform the same work that two horses will do. For the eight months in which they are fed with turnips, they keep up with the horses without difficulty. They are regularly changed, so that (except in spring) every ox works four days in the week. Two oxen out of three are constantly in the yoke, except in frosty weather, when I generally employ the ploughmen in filling carts with dung, which is then taken out of the farm-yard, and laid up to a dunghill in any situation which is judged to be most suitable. On such occasions, the oxen are laid idle in the straw-yard, * and then they get only one feed of turnips a day—not that I think they would not answer to draw in carts, but I have never had any adapted to them, because I find full employment for the men who drive them as above mentioned. In frosty weather, or indeed in any weather, they may also be usefully employed in drawing in threshing-mills, in every situation where these are wrought by animal power. Before I got mine constructed so as to go by water, the whole of the crop of one of my farms, for several years, was thrashed by thrashing-mills wrought by oxen. I found their pace far more equal and steady than that of horses. In summer, when oxen are fed with grass only, they certainly fall much short of horses fed with grass and corn, but this deficiency is fully compensated by the work of the extra oxen in the spring months; for, from the time when I begin to sow spring

* Whenever oxen are laid idle, a greater share of the labour must be thrown upon the horses, than would have been required of them, had all the teams been worked by horses, even though their drivers should be thought to be as profitably employed in filling carts as in working with their teams.—*Con.*

wheat, I always keep the whole constantly at work, till the seed grain of every kind is deposited in the ground. *

2. I always train my oxen to work after harvest, when about three years and a half old, and the horses nearly at the same age.

3. I shall not say how long an ox might be wrought to advantage, as I seldom keep them more than three, never more than four years from the time when they begin to be employed in the draught. Horses, barring accidents, do not fall much off for twelve or fourteen years from the time when they are first employed in the draught.

4. An ox, when first laid under work, is worth from 12*l.* to 16*l.* Sterling. A horse, at the same age, is worth from 30*l.* to 35*l.*; and, at the end of three or four years from the time when he begins to work, if free from blemishes, he is worth from 40*l.* to 45*l.*

5. The oxen selected for work, and those set apart to be immediately fed, are generally of equal value at the time. I do not always pick out the largest. There is something in the gait and form of these animals that denotes superior agility and vigour. These I always make choice of for work, without regard to their size. In general I find they improve each at the rate of 2*l.* per annum during the three years in which they are employed in the draught. Consequently, an ox worth 15*l.* when first put to work, may be sold at 21*l.* when laid off work, if there is no material change in the markets. The oxen, which I do not train to work after harvest, are always fed with turnips, and generally sold in February or March following, from twenty to twenty-five pounds or guineas. The draught oxen are laid off work in the beginning of harvest, and sold off at the age above mentioned, from 30*l.* to 35*l.* or guineas. From this, it may naturally be inferred, that the profit on feeding the work ox for the last six months, is considerably greater than that on the idle ox. This, however, is not the case, because the work ox consumes daily at least one-third more turnips than the idle one.

6. This query is partly answered in No. 1., and will be more fully answered in Nos. 10. and 11. Since I left off using oxen in the thrashing-mill, they are employed only to plough and harrow.†

7. The ploughman invariably holds and drives, no driver being ever employed, except during a few days when the young oxen are training. Young horses require the same attention.

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* In this case, the wages of the extra ploughmen should have been brought into account.—*Con.*

† Ploughing and harrowing is only a part, and often not the largest part, of a farmer's labour.—*Con.*

8. When I first began to employ oxen in the draught, I found it up-hill work, partly from the prejudice of my servants, but more from want of method. I now find little more difficulty in the training or in the employing of oxen than of horses. In eight or ten days, they are generally so tractable, as to be not only driven by the ploughman, but to carry him to and from the field.

9. By an account which I have kept for more than 20 years, I find that I have lost about 1 horse in 27 annually, by accident and sudden distempers to which they are liable. Since I began to use oxen in the draught, I cannot have had fewer than 60 trained for that purpose; and though I put them to every kind of drudgery, or where I think horses run any risk, such as breaking up rocky, mossy, and steep ground, I have never lost an ox, nor even had any of them so much disabled as to prevent their feeding for the butcher.

10. *Expense of keeping Three Oxen.*

Eight months on straw, at 1*l.* 10s. each, -	L.4	10	0
Three acres of turnips, at 6*l.* 10s. per acre, -	19	10	0
Four acres and a half of good pasture, at 3*l.* 3s. per acre, - - - - - - - - - -	14	3	6
One acre of cut grass or tares, at 6*l.* per acre,	6	0	0
Hay in the middle of the day in winter, 60 stones, at 1s. per stone, - - - - - -	3	0	0
Shoeing, - - - - - -	1	1	0
Interest of purchase money, - - -	2	5	0
	L.50	9	6

Expense of keeping Two Horses for the Plough.

Two feeds of oats to each horse per day, or 30 bolls Linlithgow measure *per annum*, at 17s. per boll, - - - - - - - - - -	L.25	10	0
Two acres of clover and tares, at 6*l.* per acre, - - - - - - - -	12	0	0
Swedish turnips or potatoes, a quarter of an acre, - - - - - - - -	1	10	0
Hay in the middle of the day in the spring months, 42 stone, at 1s. per stone,	2	2	0
Straw, - - - - - - - -	3	0	0
Shoeing, - - - - - - - -	2	0	0
Interest of purchase-money, - - -	4	5	0
	50	7	0
In favour of two horses, -	L.0	2	6

N. B.—My oxen draw with leathern collars and bridles, and consequently the expense in that respect is nearly the same as that of horses. It is not easy to say what may be the value of straw consumed either by horses or by oxen, so much depends upon situation, nature of the soil, &c. I have therefore calculated the expense of the straw both for horses and oxen at the same rate, a rate which tenants of breeding farms, who rear more cattle than they have winter food for, are accustomed to pay for cattle when three years old.

11. This depends so much on situation, that it is impossible to say what might be the best proportion of horses and oxen on a farm where ten teams are necessary. In the part of the country where my farms lie, most of my grain must be carried from 20 to 30 miles, and lime and coals from 18 to 24. This lays me under the necessity of keeping a considerable proportion of horses for these purposes; for I do not think that oxen (though I never tried them) would answer for long journeys on our gritty roads. The formation of their feet, and nature of their hoofs, are not at all adapted to such journeys. On my different farms, I have twenty-two ploughs drawn by horses, and eight by oxen. Were my farms situated in a part of the country where the carriage of lime and coals, and of grain to the market, is comparatively easy, I would employ a much greater proportion of oxen in the draught; for it is my opinion that they are fit for every operation of husbandry, long journeys excepted.

I have now given you my opinion candidly, and without reserve; and if the relative expenses of the ox and horse teams are so near equal when the oats are valued at 17s. per boll, I leave you to judge what the saving by the employment of oxen is when oats are near double that price.

17*th July* 1809.

After the preceding very satisfactory communication upon employing a proportion of oxen in agricultural labour has been given, perhaps it may be thought unnecessary to make any farther observations on the subject. The following remarks, however, may be made on some parts of the communication. In the answer to the 10th query, the price of oats is taken at 17s. per Linlithgow boll; For this part of the country it may safely be taken at 19s. 4d. The average of the fiars of this county from the year 1796 to 1807 both inclusive, is 19s. 4d. per Linlithgow boll of common oats; and the fiars of this county, as well as those of most others, are understood always to be considerably lower than the average prices for the whole year. The loss on account of the laying out of the purchase-money, is stat-

ed as merely the simple interest of the purchase-money. Perhaps it would have been more accurate to have stated the loss conformably to the following principles.

From the answer to the third query it may be inferred, that horses continue fit for work during fifteen years nearly, or till they are eighteen or nineteen years old. The sum of 60*l.*, which is the lowest price of two work-horses, when first fit for the draught, that is stated in the answer to the 4th query, accumulates in fifteen years, when put out at compound interest, to 124*l.* or thereabouts. At the end of fifteen years, this last sum is wholly lost to the farmer, unless he sells his horses at that period, in which case the price of the horses must be deducted from the sum of 124*l.* Now, 5*l.* 15s. lost year after year during fifteen years, is the same loss, or nearly, with that of 124*l.* at the end of fifteen years. The sum of 5*l.* 15s. then is the proper annual balance against two work-horses on account of purchase money.

There can be no doubt that, if farmers sell off their horses before they become unfit for work, the balance against them on account of their purchase money may be diminished. By this plan there would be no loss at all in some cases; for a horse may frequently be sold at a higher price than that at which he was originally purchased. But it is very plain, that, as an original plan, this is wholly impracticable. Were farmers to sell off all their horses at the age when they are at their highest value, or even when they are at any age, who would be the purchasers? The loss by the decline in the value of horses, as well as by their death, must be borne by some; and it is obvious that the chief weight of it must ever lie on the farmer. In comparing the relative advantages of employing horses and oxen in agricultural labour, the question is, "not what may occasionally happen, but what, upon the whole, or in general, must happen." From the nature of the case, it is a circumstance, at the long-run, inseparable from the employment of horses in agricultural labour, that their purchase money must be irrecoverable. It is peculiar to work oxen, that their purchase money is recoverable with gain. From the answer to the fifth query, it appears that three oxen improve in value to the extent of 18*l.* during the three years in which they are employed in the draught. This, therefore, if not modified by other circumstances, would be a balance in favour of an ox team of about 5*l.* 15s. 9d. per annum; for 5*l.* 15s. 9d. accruing yearly as profit during three years, when put out at compound interest, are worth about 18*l.* at the end of three years.

When, however, oxen are sold off at four, instead of seven years of age, there is a gain which arises from the interest of

the purchase money. When four years old, oxen are stated to be worth from 20*l.* to 25*l.* each. But let 25*l.* be taken as the price. This for three oxen is equal to 75*l.* When kept for the draught, oxen are not sold till they are seven years old, or three years later than idle oxen. At the end of seven years, or during the three years from the end of the fourth to the end of the seventh, 75*l.* accumulate, at compound interest, to about 86*l.* 16s. 5d. The difference, then, between 75*l.* and 86*l.* 16s. 5d. which is 11*l.* 16s. 5d. must be gained *cæteris paribus* by means of selling off three oxen, when four years old, instead of keeping them till they are seven years old. Now the sum of 11*l.* 16s. 5d. gained at the end of three years, is a gain equal in value, or nearly, to 3*l.* 15s. per annum during three years. The sum of 3*l.* 15s. then is an annual balance in favour of selling off three oxen when four years old, instead of keeping them till they are seven years old; and consequently it must be a balance to the same extent against keeping three oxen for the draught till they are seven years old; that is, it is an annual balance of 3*l.* 15s. against a team of three oxen.

In the answer to the 9th query, it is stated, that where twenty-seven horses are kept, one of them is annually lost by accident or sudden distemper. Supposing that the twenty-seven horses, on an average, are worth 30*l.* each, there will be an annual balance of 2*l.* 8s. against a team of two horses, on account of accidents and violent distempers. It cannot be inferred from the answer, that out of sixty draught oxen there is any lost by accident or distemper; but it is reasonable to think, that, at the long-run, some proportion of loss must be sustained on this account. Let it therefore be supposed, that, out of eighty work oxen, one may be annually lost by accident or sudden distemper; —this proportion is rather more than three times lower than in the case of horses. If the sum of 15*l.* is taken as the average price of a draught ox, the annual balance against a team of three oxen, on account of accidents and distempers, will be 11s. 3d.

The above-mentioned circumstances being premised and kept in view, the account between the ox and horse teams may be stated thus.

Expense of keeping two Horses for the Plough, as fed by the Author of the preceding Communication.

Two feeds to each horse per day, or 30 bolls Linlithgow measure per annum, at 19s. 4d. per boll -	L.29	0	0
Two acres of clover and tares, at 6*l.* per acre -	12	0	0
Carry over	L.41	0	0

	Brought over			L.41	0 0
Swedish turnips or potatoes, one-fourth of an acre				1	10 0
Hay in the middle of the day, in the spring months, 42 stones, at 1s. per stone				2	2 0
Straw				3	0 0
Shoeing				2	0 0
Annual balance against two horses, on account of purchase-money				5	15 0
Ditto ditto, accidents and sudden distempers				2	8 0
				L.57	15 0

Expense of keeping three Oxen, as fed by the Author of the Communication.

Eight months on straw, at 1*l.* 10s. each			L.4	10	0
Three acres of turnips, at 6*l.* 10s. per acre			19	10	0
Four and a half ditto, good pasture grass, at 3*l.* 3s. per acre			14	3	6
One do. cut grass or tares, at 6*l.*			6	0	0
Hay in the middle of the day in winter, 60 stone, at 1s. per stone			3	0	0
Shoeing			1	1	0
Annual balance against three oxen, on account of accidents and fatal distempers			0	11	3
Ditto ditto, on account of being kept till seven years old, instead of being sold off when four years old			3	15	0
		L.52	10	9	
Deduct annual amount of improvement in value		5	15	9	
				46	15 0
Annual balance in favour of a team of 3 oxen				L.11	0 0

From the preceding statement, it appears that about two acres and one-third more of land are required to produce food to three oxen, than the quantity required to produce food to two horses, viz. two acres and three-fourths more of turnips, and four acres and a half more of pasture, about an acre less of clover, tares, and hay, and four acres less of oats or grain. *

* This is stated on the supposition that thirty Linlithgow bolls of oats, on an average, require four acres of good land to produce them, and that an acre of clover produces about 170 stones of hay on an average. The English acre is meant.

It would also appear that if oxen were fed with clover in the first year, instead of pasture in the second or subsequent years, about two acres and one third of the clover would afford nearly as much food as four acres and a half of the pasture; for one acre of clover is set down as worth 6*l.*, and four acres and a half of pasture are set down as worth 14*l.* 3s. 6d. It follows, therefore, that this mode of feeding with clover in the first year, instead of pasture in the second and subsequent years, would require about equal quantities of land to feed three oxen and two horses. Still, however, about four acres more of turnips and grass would be required for an ox team than for an horse one, viz. two acres and three-fourths more of turnips, and an acre and one-fourth more of grass and tares. From this it may be inferred, that on a ploughgate of land, of which the labour is performed by oxen, when the quantity of grain produced is the same as when the labour is performed by horses, that is, when the same quantity of land is bearing grain in each case, the value of the stock fed in the case of an ox team, must be less by the value of two acres and three-fourths of turnips, and an acre and one-fourth of clover. Now, the value of two acres and three-fourths of turnips, and of an acre and one-fourth of clover and tares, is, by the preceding statement, 25*l.* 7s. 6d. But as the three oxen of the team altogether improve to the amount of 6*l.* annually, during the years in which they are employed in the draught, the sum of 6*l.* must be deducted from that of 25*l.* 7s. 6d. and there will then remain the value of 19*l.* 7s. 6d. less stock fed on a ploughgate of land of which the labour is performed by three oxen, than on one, of which the labour is performed by two horses, when the number of acres bearing grain is the same in both cases. It may also be inferred, from the foregoing statement, that though thirty bolls of oats less in the case of an ox team than of a horse one, should be produced on a ploughgate of land, still as many may be carried to the market, because two horses eat thirty bolls annually, and oxen eat none at all. It was before stated that thirty bolls of oats, on an average, may require about four acres of land to produce them. The whole of these four acres may, if judged proper, be converted to turnips or grass, without bringing the marketable produce of grain, in the case of an ox team, below that of a ploughgate where a horse team is employed. In order to feed the same quantity of stock for the butcher on a ploughgate of land of which the labour is performed by three oxen, as on one of which the labour is performed by two horses, as much land must be withdrawn from bearing grain, and converted to grass or turnips, as is required to feed stock to the value of

19*l.* 7s. 6d. Now, by the preceding valuation, two acres of turnips and an acre of clover are worth about this sum. Therefore, of the four acres which in the case of an ox team admit of being converted to turnips or grass, without bringing the marketable produce of grain below that of a horse team, one acre may still remain in grain as a balance on the side of an ox team. Upon the whole, then, it appears that as much stock may be fed for the butcher on a ploughgate of land, of which the labour is performed by three oxen, as on one of which the labour is performed by two horses; and, after all, the produce of grain of one acre of land is marketable, in the case of an ox team, over and above the quantity which is marketable in the case of a horse team. *

If the farmer considers it to be more profitable or expedien to raise equal quantities of grain in the case both of an ox team and of a horse one, he will have thirty bolls more of marketable oats on a ploughgate of land of which the labour is performed by three oxen, than on a ploughgate of which the labour is performed by two horses; but, as was before stated, he will have less stock for the butcher. On the other hand, if in the case of an ox team, less marketable grain should be produced, more stock would be fed: and in as far as less land may be under crops of grain, and more in grass and other green crops where oxen are employed in farm labour, the land, especially if naturally good, will be the more fertile; and the same space of it will produce grain both more abundantly and of better quality. If, therefore, a smaller number of acres are sown with grain in the case of oxen than of horses, the ultimate produce will be proportionally less diminished. For the same reason, where oxen are employed in farm labour, the land, if a greater proportion is laid to grass, will produce it both more luxuriant and more nutritious. Besides, in the case of employing ox teams, if a greater quantity of land is laid to grass, there will be just so much the less in tillage, and consequently less labour will be required of the oxen than they are able to perform. The labour, therefore, which they can thus perform beyond that of their proper ploughgate, may be otherwise applied, and in this way will bring a profit corresponding to its value; or if the farm is of a considerable size, the number of draught oxen may be diminished in proportion to the less land in tillage and to the less labour required.

In a paper published in the Farmer's Magazine, (No. XXI.),

* When the word *acre* occurs in the preceding article, the *English acre* is always meant.

it is stated by Lord Somerville, that in England oxen are frequently employed in journeys on hard and stony roads; but, in another passage of the same paper, his Lordship says, that they are subject to slight strains, or lameness, arising from travelling on such roads. This confirms the opinion stated in the communication, that oxen do not suit with long journeys on gritty roads.

In some soils, perhaps, oxen, from the nature of their hoof, may not be so well adapted to draw in the plough as horses. Whether wet or clay soils are least deteriorated by the employment of horses or oxen in the plough, is a question comparatively of small importance. The feet both of horses and oxen are very detrimental to such soils, if ploughed when too wet; and if ploughed when dry, neither the feet of oxen nor those of horses will do any material harm. An ox team, however, is understood to be more suitable than a horse one to plough old pasture lands with a tenacious sward. Such lands are not easily broken up; and, in order to their being properly ploughed, require power steadily exerted in the draught. This is well known to be more the characteristic of an ox team than of a horse one.

There can be no doubt also, that the employment of oxen may be more adviseable in some situations than in others. On land unsuitable to the cultivation of turnips, or rather where they cannot be raised, the expense of feeding work oxen must be much enhanced. On such land they must be fed with hay or with grain as a substitute for turnips; and this feeding is much more expensive than that with turnips, as well as less conducive to the health and improvement of the animals. In situations of this kind, indeed, the employment of oxen in the draught must be improper. In the neighbourhood of towns, where straw, turnips, grass, and all other kinds of green food are higher in price than at a distance from them, the employment of oxen in the draught must be proportionally less profitable or advantageous.

It may seem strange, if the employment of oxen in farm labour is so advantageous as it is stated in the foregoing account, that the use of them should have been so generally laid aside within the last thirty years, when all other agricultural improvements have been so rapidly and successfully carried on. This difficulty is easily removed. The change from the kind of ox teams formerly in use, to teams of two horses, was a manifest and great improvement. At that time no fewer than two oxen and two horses were yoked in one team, and two oxen besides were kept to relieve alternately the two in the draught. It was easy to see if two horses performed as much work as four oxen

and two horses, that the use of the latter team should be given up, and that of the former introduced; and when a practice is established, it is not in general hastily abandoned, unless the disadvantage of it is very apparent. When the change from the team of two or rather four oxen and two horses took place, it was not known that three oxen were equal to perform as much work as two horses; and even now this seems to be but very partially known. Sometimes four, but generally six oxen are stated to be necessary for this purpose.

On the supposition that the employment either of oxen or of horses in the draught is most profitable to the farmer, it seems to be unnecessary to inquire whether it will also be most profitable or advantageous to the community. It is very plain that the profits of the farmer cannot accrue from any other source than his marketable produce; and therefore if most marketable produce is obtained by the employment of oxen in the draught, the employment of them must be most profitable both to the farmer and to the community, and *vice versa*.

Upon the whole, it may be concluded that in certain situations, a considerable profit may be gained by employing a proportion of oxen instead of horses in agricultural labour; and that this profit arises chiefly from a saving of grain, though partly from the circumstance of the oxen redeeming their purchase money, and even improving in value, from the time when they begin to work to the time of their being sold, and partly also from their being less subject than horses to sudden death, accidental hurts, and occasional distempers.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Notice of the Rev. Mr Liston's improved Patent Plough.

SIR,

You would oblige me, by inserting in your next Number, the following short notice of my improved plough, for which I have obtained a patent. I shall afterwards send you a more detailed account of it, with figures.

My improvement consists, 1st, in the form of the share (or sock as we call it in Scotland) and mouldboard. I have calculated the proportional resistance or pressure made by a furrow slice, for every degree of its elevation, from its original position, as cut by the coulter and share, till it be turned over to its final position; and I form the share and mouldboard, by a series of

wedges so calculated, that the resistance may be always the least possible. The share and mouldboard thus formed, are very different from any hitherto in use; and they are found not only to save much labour to the horses, but to perform the operation in a very superior style. The superiority of the work has been acknowledged by many intelligent farmers, and is indeed obvious and unquestionable.

Another improvement consists in substituting a wheel, instead of the sole and side plates, so as almost entirely to remove the friction on the bottom of the furrow and fast land on the near side. This advantage is obtained by setting the wheel at an angle to the horizon (about 55°), so that it runs in the corner of the open furrow, and performs the office of both sole and side plates.

When this idea first occurred to me, I was afraid that the obvious advantage of saving friction might be counterbalanced by its rendering the plough unsteady, or difficult to hold. I was determined, however, to make the experiment; and had the satisfaction of finding, that all the advantage was obtained, without any of the disadvantages I had apprehended. The plough is both more steady, and more easily held. I am, &c.

HENRY LISTON.

Letters may be addressed to the care of Mr Broughton, 13, Elder Street.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

An Inquiry into the Produce of Animal Food, from the Offals of the Distilleries when working from Grain.

SIR,

BEFORE it was known that the distillers would be permitted to work from grain, and while resolutions against such a measure were entered into in several districts, I was led to make some inquiries respecting the expediency of removing or continuing the suspension. My chief object was to ascertain the amount of the butcher meat and dairy produce obtained from the offals of the corn-distillery; by which it might be known how far the prohibition of the use of grain increased the aggregate stock of food; or to what extent this addition to the stock of vegetable food was counterbalanced by the diminished production of animal food. And though the prohibition will now cease in a few weeks, it may not be altogether improper to turn

the attention of your readers to the subject; as the same views of policy which have hitherto led to the prohibition, may be expected again to operate when similar circumstances recur. Indeed, it is the opinion of many, that the various interruptions to this manufacture, which have somewhat reconciled distillers to the use of sugar, may at no distant period terminate in an absolute prohibition of the use of grain.

It is not my intention to enter upon the arguments that have been employed on both sides of the question—nor to bring into view the immediate and remote consequences of our unsteady policy in regard to the distilleries. It appears to me, that some of the arguments in favour of the corn-distillery go a great way beyond the truth; and that it has been considered a measure of far more importance to the landed interest than it really is. I say this, with a view to a continuance of such large importations of grain as we have required for the last twenty years. If it should now be found, as there is much reason to believe, that our home produce is quite sufficient for our consumption, the vent afforded by the distilleries must be of very great importance. There does not appear, indeed, to be any other vent for a surplus produce in ordinary seasons, as there is no country that does not raise grain cheaper than Britain can do. Yet with a view to the past years, I cannot see the justness of a late able writer's * opinion, nor perceive the consistency of his arguments. He wishes that foreign growers should be allowed at all times the fair competition of our market, which he thinks can never bear any resemblance to the discouragement of the British farmer, from the stoppage of the corn-distillery. Our importations he represents as comparatively inconsiderable; and he magnifies the importance of the vent afforded by distilleries beyond all due bounds. He insists, that it should never be impeded, 'even in seasons of scarcity,' but that the corn-distillery should be permitted to die a natural death from the rise of prices. These conclusions he obtains from general principles, which it is almost always necessary to modify, before they can be advantageously applied to the particular circumstances of the times. However valuable the vent afforded by the distilleries may be in seasons of ordinary abundance, there are few landholders or farmers, it is believed, who would wish the competition to be continued to this length even in years of scarcity.

On the other hand, the repeated prohibitions of the use of grain certainly have not been always rendered necessary by scar-

* Bell, on the Prohibition of the Use of Grain in the Distilleries, 2d Edit. 1810.

city and dearth. They have been sometimes injudicious, both in regard to the public interest and to that of farmers. They have also in all probability injured the latter in a greater degree than they have benefited the former. The production of a kind of grain that is best fitted for a great portion of our soil, has been discouraged; an article has been thrown into the stock of food, which is not in general demand, and that the only one of which there is usually an abundant supply raised from our own soil. In some districts, the cultivation of this grain may be supplanted by that of wheat or oats, without any serious loss; but in many others, no such change can be attempted, without a material diminution of the produce of food in the first instance, and a consequent deterioration of the soil for several years thereafter.

To judge of the expediency of prohibiting the use of grain in the distilleries, it is obviously of consequence to take into account the diminished supply of animal food which this prohibition occasions. It would appear that at the Lowland distilleries of Scotland, not less than six thousand cattle may be fattened yearly; and that a still greater weight of pork than of beef might be produced, if there was a demand for that article. A considerable proportion of the offals are employed even more profitably than in fattening cattle, as they are the chief dependence of cowfeeders in large towns for supplying the inhabitants with the indispensable article of milk. In a comparison between distillation from grain and from sugar, and in making an election between them, these considerations deserve much more attention than has been hitherto paid to them; besides that it is well known of how great importance it is to farmers to find a market for damaged grain that is altogether unsuitable for any other use. The offals of the corn distillery produce a quantity of butcher's meat and of milk, very little if at all inferior to what the land on which the barley was raised would have returned if it had been in pasture. Experiments have been made for the purpose of ascertaining the produce from an acre of barley consumed in the distilleries, and from an acre of land of the same quality in pasture; and the result, it is believed, was in favour of the barley land.

It does not seem necessary to advert to the claims of the West India planters, in treating of the question with reference to a saving of human food: the dreg from the sugar distilleries is of little or no value for any purpose. Yet they have found means to mingle their interests with the discussion; and one at least of the late prohibitions seems to have been imposed with no other view than to serve that body. The report of the Committee of the House of Commons, 19th April 1808, scarcely admits of

any doubt on this point. There are many who do not approve of prohibiting the use of grain, and yet consider it noway objectionable to permit distillation from sugar upon equal terms. But unless there is an actual scarcity of grain, which justifies the total prohibition of it, this measure of equalization ought not to be recommended. In seasons when the crop is not beneath an average one, there seem to be strong reasons against it. The food produced from the offals of the corn distillery, should give a preference to the use of grain, until prices rise to 20 per cent. above what would have been thought advisable with a view to the supply of food, had both the corn and the sugar given offals of equal value. For instance, if the use of sugar is permitted when barley is at 40s. a boll, the superior produce from the corn distillery would seem to require such regulations as would give it a preference till the price had risen to 48s.

The grains, or draff and dreg of the corn distilleries, as has been already observed, are chiefly consumed by milk cows, and by fattening cattle. It is difficult to calculate, with any degree of accuracy, without careful experiments, what may be the milk returned from any given quantity of these offals, because the cows almost always have other food along with them. It has been already noticed, that the result of some experiments was rather in favour of the offals from an acre of barley, when compared with the same extent of pasture. It is however well understood by the cowfeeders, that neither turnips nor potatoes, nor the draff from breweries, can supply their place both in producing milk, and at the same time fattening for the butcher. With regard to their value in producing beef, a nearer approach may be made, from these grains and dreg being the only food of the cattle, except that they are sometimes allowed a little straw. When the value of their improvement is known by their advance of price, it is much the same thing as if their additional weight were ascertained. Weighing alive is not indeed a common practice in Scotland; and in any particular case, that is certainly the most correct mode of ascertaining the beef returned from a given quantity of food. The result however would not apply to cattle of different breeds, nor to the same breed at different ages, and in a more or less advanced stage of improvement when put up to feed. The price paid for their food is perhaps a criterion sufficiently accurate, especially when its value is fixed by the general consent of the owners of the cattle and of the food, and remains nearly the same for a number of years.

For several years previous to the late prohibition, the price paid by the owner of the cattle at distilleries at a distance from towns, was one guinea per month for each beast; and it is be-

lieved there was no particular regulation with regard to the weight of the cattle. For each stake there was therefore paid to the distiller 12 guineas yearly; the person who rented them changing his cattle as often as he found them ready for the butcher; usually once in six months, but sometimes in four. It is understood, that a still of 40 gallons, working throughout the year, in the Lowlands of Scotland, would give grains and dreg sufficient for 120 stakes; the value of which, at 12 guineas, is 1512*l*. Supposing 1000 gallons of still contents required for the supply of the market with spirits, the offals of the whole of the Lowland distillery alone, if they were all applied to the fattening of cattle, would be worth 37,800*l*., or about one-sixth part of the usual value of the barley consumed.

A diminution of the supply of butcher's meat to this extent, by the prohibition of the use of grain, must be severely felt in all those districts where the soil does not permit the extensive cultivation of turnips; and it is certainly partly owing to this, that butcher meat has been so very high priced for the last twelve months. The consumption of the prisoners of war in Scotland, must have increased the demand; but the consumption of the labouring class has probably been as much diminished by the high prices of grain.

Besides this mode of estimating the offals of the corn distillery, they are often sold by measure, both in large towns and in the country. The distillers near large towns seldom either feed cattle on their own account, or in the way already mentioned. They sell their grains at from 4s. to 5s. per boll, and their dreg at 3s. per puncheon of 120 gallons. Rating the grains at 4s. 6d. the offals of a still of 40 gallons are worth 1780*l*. 19s. In the country, the grains bring 3s. a boll, and the dreg is given along with it. The value in this case is 982*l*. 16s. To account for this last amount being so much below what is received for feeding cattle, it must be considered, that the expense of feeding-houses and attendance is saved, and that, in some districts, so many turnips are raised, as to lessen the demand for fattening with the distillery offals.

It is believed, that these statements furnish a tolerably correct idea of the value of the offals from the corn distillery. It may be desirable to know from what extent of land this value is obtained; and then it will appear how much beef is produced from every acre of barley consumed in distillation.

On these points, it is evident, that nothing more than a near approach to the truth is attainable; and the following calculations do not even pretend to this. The quantities of grain consumed may be somewhat different, as well as the quantity pro-

duced per acre. If both these should be ascertained, the weight of beef returned can only be estimated from the additional price of the cattle, or from the price paid for their food, in addition to the profit of their owner.

With regard to the consumption of a still of 40 gallons, it has been stated at about 6000 bolls, of nearly 6 bushels, for 12 months. If 8 bolls per Scotch acre is considered a fair average produce, 750 acres will produce this quantity. When the offals are disposed of for fattening cattle, at the rate of a guinea per month, the amount, as already mentioned, is 15 *l.*; which, divided by 750, gives a fraction more than 2*l.* for each acre of barley.

But it is evident the beef produced must pay much more than this, which may be called the rent only. The distiller is in the same situation with the proprietor of grass parks; and the owner of the cattle in this case may be considered to be entitled to the same profits as the grazier. His expenses in purchasing and selling, his risk and outlay of money, are all of them as great, or probably much greater. The amount, however, must be matter of conjecture or probability only. The property-tax assumes the profit of the grazier to be equal to half his rent. A rent of 2*l.* per acre must therefore require a produce worth 3*l.*; or, for every acre of barley,—beef, tallow, and other offals worth 3*l.*, must have been produced from the grains and dreg. If each beast should return a profit of 10*l.* for six months feeding, as has been received in many cases, the produce must be considerably greater.

To estimate from these data the weight of beef produced, the price at the time the above mentioned rent was paid for stakes must be kept in view. It was not then more than 8*s.* per stone English, sinking the offals, though it has been higher since; and probably was not so much. At this rate, 3*l.* would correspond with 105 lib. of beef, which may be taken as the produce from each acre of barley used in distillation. It is supposed that the average produce of good grazing lands in Scotland cannot be rated above 160 or 170 lib.; so that an acre of barley yields about two-thirds of an acre of good feeding pastures.

It is unnecessary to pursue these calculations farther. The offals of the corn distillery are still more valuable when employed in producing milk; and would return a much greater weight of pork than of beef. A good many cattle, too, are fed in this way, which could scarcely be fattened in any other.

The only other observation I shall offer in favour of the use of grain, which evidently results from the preceding statements, is, that a very great quantity of valuable manure is obtained.

If 120 cattle are fed for 12 months on the produce of 750 acres, their dung, when absorbed by straw, moss, earth or compost, may be sufficient for manuring all the land upon which the barley was grown.

Many of your readers, I presume, are much better qualified to write on this subject than I can pretend to be; and I am very sensible they may be able to point out some very considerable errors in my statements; though I have taken some trouble to be well informed, and have in no instance ventured to depart from what I conceived to be good authority. Still the quantity of beef produced from an acre of barley does not come up to the produce of an acre of good pasture, as the experiments alluded to are said to have ascertained; so that I suspect these calculations are not correct. For any temperate remarks on them, and on other points connected with this important subject, I shall feel very grateful, and will readily acknowledge any errors which I may have committed.

I am, &c.

Oct. 1818. R. A.

FOR THE FARMER'S MAGAZINE.

On the Management and Value of Coppice, from Whyte and M'Farlane's Survey of Dumbartonshire.

"Copse-woods form a very important and prominent article in the produce of this county. They cover some thousand acres of soil, which would otherwise be altogether or nearly useless, and yield an income to the proprietors, little inferior to what they derive from their best arable land. The steep sloping banks of Lochlomond and Lochlong, where the bases of the mountains run into the lake, are in many places covered with them. The thin dry soil which appears in small patches among the rocks, seems to be particularly adapted to the growth of oak-copse, which from its superior value, is chiefly encouraged in such situations, while the moister and more unfavourable spots are allowed to be occupied by less valuable trees. These are chiefly ash, yew, holly, mountain ash, birch, hazle, aspen, alder, crab, thorn, and willow. The seven last kinds are considered inferior in value to the rest, and commonly known by the name of barren timber.

A considerable difference of opinion subsists with respect to the age at which copse-woods ought to be cut. Some competent judges insist that the interval between two successive cut-

tings ought not to exceed twenty years; while others consider it more advantageous to let them grow twenty-eight or thirty years before they are cut down. Perhaps this diversity of judgment may be accounted for in part, by observing that their opinions have been formed from an acquaintance with woods cut in different circumstances, and different situations. Woods growing on low grounds, on good soil, and on banks facing the south, grow more rapidly, and are sooner fit for cutting, than those which stand at a higher elevation above the sea, and enjoy a less favourable exposure; and, consequently, no general rule can apply exactly to cases dissimilar in these respects. The prevailing opinion however is, that it is safer, with a view to profit, to cut copse rather under the age to which it is usually left, than to suffer it to grow older. The oak-bark, in which the value chiefly consists, is of better quality during the early period of the growth of the tree. In most situations, the bark of wood which has stood upwards of twenty-four years, becomes hard and loaded with what is technically called cork; so that what it has gained in bulk, does not by any means make up for what it loses in weight and value at the tan-pit. On these grounds the most experienced wood-cutters agree that copse ought on no account to stand uncut after it has advanced to the age of twenty-four years; and this opinion is now adopted by most proprietors whose woods are of such value and extent as to make the management of them an object worthy of their attention. Accordingly, from twenty-two to twenty-four years may be considered as the average age, at which it is at present the practice to cut them down. Still, in every particular case, a considerable portion of attention and experience are necessary, in order to ascertain the precise period when they may be cut to most advantage. During the two or three last years of their growth, they improve much more quickly than at any former period; and the art of the judicious wood-cutter consists in selecting that season for disposing of them when they are no longer improving, but have not yet begun to fall off. Some years ago, before the great demand for oak-bark, and its consequent high price, had made woods so valuable as they now are, little attention was paid to the manner of cutting them, or to preserving the young shoots. The trees were cut one or two feet above the surface, as was most easy and convenient for the wood-cutter, and the stumps left ragged from the axe. The woods when cut, were slightly, if at all enclosed; and, after the first year, the cattle of the adjoining farm were permitted to pasture in them without restraint. Thinning the shoots, or clearing away the brush-wood, was seldom thought of; or, when it was attempt-

ed, was conducted more with a view to immediate profit, than the ultimate benefit of the proprietor. The consequences of this negligent mode of management were in many respects pernicious to the woods. The ragged stumps were apt to become rotten and decayed from the lodging of the water on their tops. A multitude of young shoots sprung out of the sides of the stock, feeble from their horizontal direction, and having from their number neither the room nor the nourishment necessary for bringing them on to a good size. The tops of such as were bitten or trodden by cattle, became crooked and stunted in their growth, with hard and thin bark, and the mischief became still more serious from the omission of thinning, which did not give the saplings room to grow healthy, and of proper dimensions. Where the importance of thinning was perceived, it was commonly done by contract, and the contractor was at liberty to dispose of the rods which he cut for hoops. It therefore was his interest, and in the first instance, though not ultimately, that of the proprietor, to defer that operation till the young shoots had grown large enough for his purpose; and to cut out the largest rods, and those which would bring the best price from the cooper, leaving the worst shoots, when it was too late for the air and room they now enjoyed to do them much good, to fill up the wood, and yield what produce they might at the usual period of cutting. In all these respects, the management of copse-woods has undergone a material improvement.

The purchaser is taken bound, under a heavy penalty, to cut and peel the stocks close to the ground, and to dight or smooth them on the top. By this mode of cutting, the young shoots are made to spring in a great measure directly from the earth, and soon acquire roots of their own, independent of the parent stem. Hence they grow tall and vigorous, in a direction nearly perpendicular, and shoot rapidly to such a height as to be out of all danger from the occasional trespasses of cattle. The woods, when cut, are immediately enclosed with paling; materials for constructing which are generally reserved from the sale; and cattle of all descriptions are carefully excluded during the first six or seven years of their growth. Where a greater degree of attention than usual is paid to their preservation, they are enclosed with stone walls, kept in the proprietor's own possession, expressly reserved from the leases granted to the tenants of the adjoining farms, and no cattle permitted to enter them at any time. The expense of enclosing in this way is thought to be compensated by the permanence of the fence; and the sacrifice of the pasture, which is of small value where the wood is of vigorous growth and sufficient thickness, is more

than repaid by the complete security of the young trees, which are often materially injured by cattle, long after the usual years of haining. During their growth they are thinned, in some instances three times, but more commonly twice. The first thinning or weeding, as it is called, is given when the woods are from three to six years old. The thorns, briars, and other useless plants growing among them, are carefully cut down, and the weakest saplings lopt off, that the remainder may have free air and room to attain their proper size. This operation is repeated at the end of nine or ten years, when the copse has attained from the 12th to the 16th year of its growth. Any brush-wood that may have sprung up since the last weeding, is cut down, and the young trees smartly thinned, so as to afford ample room to those that are left. The practice of selling the rods for hoops is generally given up, as it is found much more profitable to cut them into short lengths, and peel them, in order to obtain the bark. The sticks, when thus peeled, are of little value, and poor people are often allowed to pick them up for firewood; but the price of the bark far exceeds what could have been got for them as hoops. These operations are considered too important to be trusted to the integrity and discretion of men working by piece-work, and therefore they are performed by labourers who are paid by the day, and work under the eye of a person of approved fidelity and experience. The average expense cannot be exactly ascertained, as it must vary in every particular case, according to the age and thickness of the wood, and the quantity of brush-wood to be removed; but it is generally admitted, that the produce from the second weeding, is nearly, if not altogether equal to the expense of both. Even though this operation should yield no such immediate return, and the whole expense were to be a temporary outlay, it would be the interest of the proprietor to subject himself to it in the first instance in order to obtain the additional price which the increased value of his woods must secure to him when they come to the market.

Where copse-woods are of large extent, they are sometimes divided into several hags or separate enclosures, which are cut in succession; and where these are so numerous as to equal the number of years allowed for the growth of the woods, and consequently one of them can be sold every year, they make a regular, and for many years past, a certain addition to the income of the landholder. The former practice was to sell the whole woods on an estate at once, allowing the purchaser to cut down one lot each year, and to pay the price by a proportionate number of annual instalments. In this way, the benefit of an ad-

vancing price of bark and timber was enjoyed entirely by the purchaser, and not by the proprietor. Now that wood owners have become more awake to their own interest, a different system is adopted. The wood or hag to be disposed of, is sold immediately before it is to be cut, and most commonly by public auction. The barren timber is cut down in spring, and the oak from the beginning of May, or as soon after, as the rising of the sap allows the bark to be peeled, to the middle of July, when the whole must be finished, so as to leave time for the pushing out of the young shoots before the frost sets in.

The division of labour takes place to a considerable extent in turning the produce to its different uses. The purchaser who is commonly a dealer in oak-bark, often sells the timber for a certain stipulated sum to a timber merchant. When the trees are felled, the buyer of the timber sends his men to saw it into proper lengths, for the various uses to which it is to be applied. The bark is next stripped off. This is done for the most part by women, who, when the purchase is considerable, are collected in the neighbouring large towns, and receive much benefit in their health from the purifying air, and wholsome diet of the country. They beat the bark with wooden mallets, till it rises readily from the timber, and then pile it on small stages to be dried by the sun. When sufficiently dry, it is secured in temporary barns or sheds, till an opportunity occurs of sending it to the tanner. The barns are erected in most instances on the shore, where the bark can be readily shipped on board the lighters or coasting vessels, in which it is conveyed to market. In this way, every advantage is taken of their proximity to water carriage, which enhances not a little the value of copse-woods in Dumbartonshire. The peeling, or as it is called *dinging off* the bark, is done by piece-work, at the rate of 5*d.* per stone. The bark sold, in 1790, at the rate of 5*l.* to 6*l.* per ton. At present it brings not less than 17*l.* per ton, when laid down at the tan-pit. A calculation, common some years ago, was, that the value of the timber should be, on an average, nearly equal to the expense of cutting the wood, making the bark, and bringing the whole produce to market; and that the price of the bark was to constitute the whole fund from which the purchaser could expect to draw his own profit, and the means of fulfilling his stipulations with the wood-owner. Notwithstanding the great rise which has taken place of late in the wages of labour, the increased value of every sort of timber has more than kept pace with it; and now not only defrays the wood-cutter's expenses, but affords a surplus in aid of his profits. The cart-wright, cooper, and boat-builder, give high prices for every piece of

wood, of proper size and sort for their respective purposes; and the smaller branches which were formerly given away, or sold for a trifle to be burnt, are now sold at 1*l.* per ton to the manufacturers of dyeing and printing colours, who extract from them the liquid pyroligneous acid in considerable quantities, and apply it to various uses. In this process a considerable bulk of tar is also obtained; and the wood is reduced to very fine charcoal. The oak growing on the banks of Lochlomond, is found to be superior to any other for these purposes; and a considerable quantity of it is consumed annually, by Messrs Turnbull & Co. in their works at Glasgow, and at Millburn in Dumbartonshire.

The value of copse-wood by the acre, cannot be easily ascertained. In every particular instance, it must depend on the thickness of the wood, the soil on which it grows, and the kind of trees of which it is composed, and vary with every variation in any of these circumstances. Near twenty years ago, the woods in Luss were estimated at the annual rent of from 10*s.* to 12*s.* each acre; which, supposing them to be cut at the end of twenty-four years, gives from 12*l.* to 14*l.* as the price of a cutting. At present, they must be valued much higher. A wood measuring 55¼ acres, is stated by a competent judge to be worth, at the present rate of markets, upwards of 2200*l.*; which is not less than 40*l.* each acre. Still more extraordinary, was the return from four acres on the point of Ferkine, a rocky and almost perpendicular promontory running into Lochlomond. When the wood on them was cut a few years ago, at the age of twenty-eight years, it yielded a gross produce of more than 400*l.*; which, after deducting expenses, allows a very liberal price to the owner. From these facts, we shall be justified in concluding that the average value of oak-copse in this county, when it has attained the twenty-fourth year of its growth, is not less than 30*l.* each acre, which is equal to a yearly rent of 1*l.* 5*s.* This is a return far exceeding what could be drawn from the soil on which it grows in any other way; and will account for there being nothing to say in this Report, under the head of woods grubbed up.

Still there are few woods which do not admit of being very materially improved. On the upper skirts of most copses, the ground is to a considerable distance covered with heath, among which a few diminutive bushes of oak are thinly scattered. Were the heath burnt in spring, and cattle excluded from the field, these bushes would soon spring up into trees, and in a few years rival the most valuable parts of the adjoining woods. In almost every wood there are large spaces unoccupied with trees, the grass of which is of little or no value; as, during the years of

haining, it cannot be made into good hay for want of a free circulation of air; and even when cattle are admitted, it does not afford them wholesome or palatable food; indeed in many instances the surface is so rocky and irregular, that it yields scarcely any *grass* at all. All these might be gained to the wood by dropping acorns where the soil is suited to the growth of oak, and planting every vacant space with such trees as appear best adapted to it. This has been tried with great success in the woods of Kenmore and Blairrennich, on the estate of Arroquhar. In the course of 18 years, the larches, firs, and seedling oaks growing there, have come to be two feet in circumference; and every part of the ground within the enclosure is occupied with as many trees as it can carry on to a proper size. Another method of thickening oak woods, which has been tried with success, and might be extended with advantage, is by layers. The rods which would be removed in thinning or weeding, are, at any period of their growth, from the second to the sixteenth year, bent down to the ground, secured in a horizontal position by forks, and buried in the sod at proper intervals. In a short time, those parts which are in the earth, send out new roots, which are speedily followed by the growth of young shoots. The communication with the parent stem may then be cut off; and the new stool thus formed, becomes in due time fit for being cut along with the rest of the wood. It is easy to perceive, that any oak-wood growing on a proper soil, may in this way be brought to its maximum of thickness at no distant period.

Another improvement which has been suggested, is *felling* all the wood each time it is cut, and leaving no standards or reserves. The usual practice is to reserve at each cutting a certain number of young trees, which are commonly called *maidens*. At the second cutting these will be near 50 years old, when the greater part of them is cut down; but some are still left, which are then called *standards*. In like manner, at each successive cutting their number is reduced; but some are allowed to remain till they grow up to timber trees. It cannot be disputed that these are extremely ornamental on the sides of high roads, and in the neighbourhood of gentlemen's seats; and it has been thought that they are also profitable, in so far as a certain proportion of large timber helps the sale, and enhances the price of each lot. It is however contended by many good judges, that the loss incurred in this way far exceeds the profit gained. The long period which elapses before they yield any return, would bring up the price they might have fetched at first, with accumulated interest, to a sum more than equalling what they are sold for at last; while, in the mean time, the surrounding trees are destroyed, as far as their branches

extend on every side. When they are cut down, an unsightly gap is left, which cannot be filled up for a long time, as no young shoots of any value spring from the stump of a large tree. It has been found that there is no growth from stocks exceeding 14 inches in diameter, and that it is comparatively feeble when they approach to that size; whereas from stems which measure from three to six inches in diameter, the young shoots spring up with incredible vigour and rapidity, attaining sometimes the height of six or seven feet, and the thickness of half an inch, in the first year of their growth. Hence it is thought by the advocates of this opinion, that the whole wood ought to be levelled at each cutting, with the exception of perhaps a few maidens, none of which ought to be reserved beyond the period when the copse is cut a second time. Without giving a peremptory decision in this controversy, the practical determination of which will probably depend in most cases on local circumstances and considerations, we may safely conclude with the very intelligent and respectable author of the Statistical Account of Luss, that in reserving standard trees, those ought to be selected which are apparently healthy and vigorous; that they ought to stand on the outer skirts, or in vacant parts of the wood; and that particular care ought to be taken, in pruning, not to lop off great branches, by which the tree is often irreparably injured, and prevented from ever attaining its full size and value."

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Comparison between the Cheviot and Black-faced Breeds of Sheep in the District of Tweeddale.

SIR,

THE rage for introducing the Cheviot breed of sheep, and of course for taking sheep-farms, has greatly subsided in this county, partly from the low price of that kind of wool, and partly from the great losses sustained by a number of farmers in changing their stock to that breed, and from the great risk in bad lambing seasons. Several late taken farms have been given up; and, much to the honour of the Tweeddale gentlemen, I have heard of no instance of any refusal being made by any of them, to liberate their tenants from such farms as had been too dear taken.

From the superiority of the wool of the Cheviot, there can be no doubt of their being preferable to the black-faced breed

on low sheltered situations, or even on good grassy pasture, though not very low, where plenty of hay can be procured for them for the winter. But on high exposed situations, or on coarse pasture, or where plenty of good hay cannot be procured for the winter, the farmers of this county and neighbourhood (many of them from sad experience) seem to be unanimous in opinion, that the black-faced breed, when properly selected, are the most profitable, even almost independent of the risk in lambing. As in these situations, not only a considerable number of young lambs, but likewise a considerable number of hogs (sheep in their first year) fall in bad seasons; and a number of such as get through the winter, are so stinted in growth, both as to carcase and wool, that they are but of very inferior value. Some farmers in this county, who had introduced the Cheviot, have purchased black-faced lambs, in order to get back to that hardy race again. Several others will probably follow their example, especially in stocking new taken farms. I have heard some very judicious farmers, on tolerably good situations, candidly acknowledge, that they have lost more by the introduction of the Cheviot breed than ever they expect to recover; yet since they have got them naturalized, they judge it prudent to continue them, as changing again would not reimburse their former losses; but that if they were to stock anew either these farms, or similar ones, they would without hesitation prefer the black-faced breed.

It is difficult to make a fair comparison betwixt the merits of these breeds, by the price they bring in the market; as the Cheviot generally occupy the best ground, and the black-faced, not only worse pasture, but a higher situation; but on middling pasture, and at a medium height betwixt the higher and lower grounds in this county, I am of opinion, that the black-faced breed, either ewes, wedders, hogs, or lambs, will bring as much money in the market as the Cheviot; and it has often been seen, where ewes and lambs of these different breeds have been fed on the same pasture, and sold to a butcher at the same price, to lift at different times, that the first lift of both lambs and ewes consisted in the greatest proportion of the black-faced; and when there were any of the worst shot or drawn, that these consisted in the greatest proportion of the Cheviot, which of course were sold at an inferior price. A few years ago, when the rage for stocking with the Cheviot breed ran high, and the wool sold at high prices, there was a considerable difference of price on lambs and hogs in favour of the Cheviot; but that having now subsided, they have again found their level. The numbers kept of the Cheviot and black-faced on the same ground, may, at a medium, be 7 of the former for 8 of the latter, more or less, as the

soil and climate may be for or against the Cheviot. The loss of lambs may be, on an average, from 15 to 20 *per cent.* Several farms in Spring 1812 lost from 40 to 50 *per cent.* of lambs, besides a considerable number of hogs; but these losses are seldom exposed by the farmer. The prices of both kinds, when sold from the same kind of pasture in middling situations, may at an average be for great ewes (ewes in lamb), in the spring, from 23s. to 24s.;—when fed off with turnips in the following winter, from 24s. to 26s. Of wedders three years old for feeding, from * 27s. to 29s.;—when fed off with turnips the following winter or spring, from 32s. to 35s. Lambs, fed for the butcher, from 10s. to 14s. It is reckoned a considerable improvement for feeding lambs, to put Cheviot tups to black-faced ewes; the lambs grow to a larger size, and may bring 1s. more in price than either Cheviot or black-faced. From 6 to 7 fleeces go to the stone of 24 lib. English; and it sold nearly as follows: In 1811, Cheviot, at a medium, 19s.—black-faced 10s. In 1812, Cheviot 22s.—black-faced 10s. Last season, Cheviot 22s.—black-faced 12s. at clipping time; but now it would readily give 17s. Tar, mixed with butter, 2 lib. of the latter to a Scotch pint of the former, with a pint of train-oil to 10 pints of tar, is the most approved salve for smearing the Cheviot sheep; and will smear at an average 60 sheep, or 6 to the pint of tar. The black-faced require nearly the same quantity of tar, but about a fifth less of butter.

I am, &c.

T. R.

* When near the time of clipping, the Cheviot (when in as good condition, which is seldom the case) will bring from 1s. to 2s. more than the black-faced.

BRANCH II.

Review of Agricultural Publications.

General View of the Agriculture of the County of Angus, or Forfarshire; drawn up for the consideration of the Board of Agriculture. By the Rev. James Headrick, Dunichen. London, Nicoll, &c. Edinburgh, Constable & Co. pp. 590. App. 120. 1813.

The general plan of the County Reports must be already well known to our readers. It embraces a great variety of topics—some of them of such a description, as cannot be treated of with any near approach to accuracy, and others which are discussed much in the same manner in almost every Report. But besides these, there are in almost every extensive county several practices in husbandry, which differ somewhat from those of other counties, and which should be generally known, either for the purpose of being censured with a view to amendment, or that such as are valuable may be adopted in other counties. So far as concerns the Agriculturist, this seems to be the chief value of these Reports.

It cannot be denied, that all these objects might be attained within a much less compass than a large octavo of 600 or 700 pages; and that this great size renders the County Reports hardly accessible to the greater part of farmers. It is nevertheless very desirable to have works, which detail with some minuteness the particular circumstances of each county, or which may serve as books of reference both in the present and in future ages.

It has been observed with truth, that no extensive country, was ever so minutely examined and described, with a view to its internal improvement, as Great Britain has been, since the establishment of the Board of Agriculture. Never was there collected, in any age or country, so large and so valuable a mass of information, upon subjects of the first national importance: and this has been done, too, at an expense so incredibly small, that the whole funds placed under the management of the Board, since its institution in 1793, would not probably support our foreign expenditure for a single day! Even this comparatively small sum seems to have been obtained with a grudge, and not without opposition. Every candid mind will admit, that the

Board have employed these funds with the greatest economy. Indeed, it might be justly chargeable with extreme parsimony, or even with some degree of injustice, towards its Reporters, if it were not easy for its members to transfer the charge to another quarter. Instead, therefore, of censuring the undue prolixity of some of these gentlemen, we ought rather to admire their liberality in having done so much, for a reward, which has seldom perhaps been equal to the wages of common labour.

Of the advantages which the public have already derived from the Board and its correspondents, and from the numerous Reports which have been published under its direction, it is unnecessary to say any thing in this place. Those who are so ignorant or so prejudiced as to deny the merits of this Institution, may consult a very well written pamphlet by the Secretary, containing the substance of a lecture read to the Board in May 1809. Since that time the Board has been engaged in preparing a General Report for Scotland, which we understand to be now nearly completed. This work, which will probably contain all that is of general utility in the County Reports, will obviate the inconvenience that has been complained of, from the great bulk and price of the later Reports; and place within the reach of the landowner and the farmer, as well as of the public in general, such distinct and useful information concerning every department of Scottish husbandry, and subjects connected with it, as cannot fail to produce the happiest effects on the future improvement and prosperity of the country.

The county of Angus, or Forfar, is one of the most important in Scotland, both for the extent of its arable land, and for its fisheries, manufactures, and commerce. Of all these, this author has given a pretty full account; and has displayed a good deal of scientific knowledge on subjects but remotely connected with agriculture. The general reader, as well as the husbandman, will therefore find this work highly interesting. The nature of our Journal, however, only requires that we should particularly attend to the agriculture of the county.

In the First Chapter, or Book, as the divisions of this Report are named, we are informed that this county extends over 891¼ square miles, or 532,243 English acres, without including portions of two parishes, the greater parts of which are situated in the contiguous county of Perth. It is divided into four districts, viz. 1*st*, the Grampian, which includes somewhat less than a half of its superficial area; 2*d*, the Strathmore, which is a great valley, running parallel to the Grampians, from their commencement in Dumbartonshire to their termination on the borders of Aberdeenshire. Very little of this valley seems to

exceed 200 feet of elevation above the level of the sea; and it may contain about 170 square miles of generally fertile and well cultivated land. *3d*, The Seedlay hills, containing about half the extent of surface of the former, with a much smaller proportion of arable land; and, *4th*, the Maritime District, which contains 222 square miles, and is, with few exceptions, a fertile and highly cultivated tract. Shell marl abounds in various parts of Strathmore, and limestone in the other three districts; but coal has not hitherto been found in the county. From late trials, there is said to be a flattering prospect of reaching a workable bed, at a place which lies within the northern boundary of the great coal-field of Scotland.

From the Section on Fisheries we extract the following remarks, which may probably be new and somewhat interesting to many of our readers.

'*Salmon fisheries* have been carried to a very great extent, on all 'the eastern rivers and coasts of Scotland, ever since Mr Dempster 'of Dunichen suggested the plan of conveying fresh salmon to the 'capital of the empire, packed in ice. Those who first adopted this 'plan realized princely fortunes; and the proprietors of salmon fish-'eries have obtained rents which may almost seem incredible. Every 'salmon fishery of any note, on the east coast or rivers, is now pro-'vided with an ice-house, in which a sufficient stock of ice is stored 'during winter, to serve during the ensuing fishing season. The 'salmon are packed in large oblong wooden boxes, with pounded 'ice interposed betwixt them, and they remain in the ice-house until 'they are removed on board the smack. They are conveyed to 'London as fresh as when they came out of the water; and the ice 'which remains unmelted is used by confectioners, and for cooling 'wine and various liquors. The fishers commonly contract with 'the London fishmongers, to furnish salmon during the season, at 'so much a hundred weight. Thus they obtain one great advan-'tage, that they are certain of disposing of any quantity of fish they 'can take. But these arrangements operate to the disadvantage of 'the neighbourhood, where only the inferior sorts of fish are sold; 'and when the London market is overstocked, they are often sold 'there at a much lower price than they can be procured for on the 'spot where they are taken. I remember when servants in the 'neighbourhood of Stirling used to stipulate, that they should not 'be obliged to eat salmon more than thrice in the week; but since 'this mode of conveying them was introduced, they are seldom 'troubled with them even once a year.'

'During autumn, the salmon always run up the rivers to deposit 'their spawn. There are certainly various breeds of salmon, as well 'as of herrings and other fishes; and experienced fishers can distin-'guish between the breeds of contiguous rivers, with which they are 'acquainted, with as much accuracy as a shepherd can distinguish

'sheep from goats. The three rivers, Forth, Teath, and Allan, unite their streams about two miles above the bridge of Stirling. Each of the streams poſſeſſes a breed of ſalmon well known to the people there, and to all the fiſhers in the Forth. Yet no ſalmon of one river was ever caught in the other; though, when they run up theſe rivers, they are ſo muddy by exceſſive rains, that the animals cannot ſteer their courſe by their ſight, but muſt be led by their ſmell, or taſte of the water. At Berrydale, too, in Caithneſs, the property of Sir John Sinclair, there are two ſtreams, the Langwell and the Berrydale, which form a junction a few hundred yards above the place where their united waters enter the ſea. A ſhort way above the point of junction, there is a cruive upon each ſtream, which only catch ſalmon during autumnal floods, when the water is exceſſively muddy. Yet experienced fiſhers there aſſured me, they never found a ſalmon in the Berrydale cruive that belonged to the Langwell, nor *vice verſa*.—It is needleſs to multiply examples, thoſe which are well authenticated being almoſt innumerable, whoſe united evidence eſtabliſhes the fact,—that every river has its particular breed of ſalmon; that though when theſe fiſhes are roaming through the ſea, they may drink freſh water in the mouth of any river that comes in the way; yet they never run far up any river but their own, and always return to their own river to depoſit their ſpawn. Thus far the facts ſeem to be incontrovertible; but many are of opinion that every river has not only its peculiar breed, but that every place in that river which is adapted for ſpawning, has alſo its ſubordinate breed; and that ſalmon always return to the place where themſelves were ſpawned, in order to depoſit their ſpawn. If prevented from accompliſhing this intention of nature, it is aſſerted that they drop their ſpawn at random, without ſuitable preparation; that it never comes to maturity; and their race ſoon becomes extinct.'

'It has often been a ſubject of diſpute, whether the ſalmon trout, or *grilſes*, as they are more frequently called, which aſcend the ſalmon rivers towards the cloſe of the fiſhing ſeaſon, be ſalmon, or a different ſpecies of fiſh.—To ſettle this point, ſome experienced fiſhers at Berrydale in Caithneſs, aſſured me, that one ſpring they caught a conſiderable number of ſmolts, or ſalmon fry; and having clipped certain marks on their fins and tails, which they noted, they let them go into the ſea. The ſame ſeaſon, they caught a conſiderable number of the fiſhes marked in this way, grown to the ſize of grilſes; and having let a number of them go again, they caught moſt of them, next ſeaſon, grown to the full ſize of ſalmon. There can therefore be no doubt, but that grilſes are ſalmon of one ſummer's growth.' p. 99–103.

In the Second Section of Chapter III., there is a very good account of the Farm-houſes and Offices of a former period, and of their ſucceſſive improvements. With regard to the mode in which they are now built and repaired in this county, the practice is very various, and no general rule is followed. On this point the author obſerves—

'In other cases, the landlord allows what sum the tenant thinks necessary, and receives 7 or 7½ *per cent.* of additional rent for the money expended, while the tenant keeps the buildings in repair. This seems to be the most advantageous mode, and least productive of disputes, both for landlord and tenant. The landlord sinks money on heritable security, at a high interest, upon his own estate, and gets the average return of money laid out in building houses in towns. The tenant, knowing he is to pay a high interest, will seek no more than is absolutely necessary for his comfortable accommodation, and will take care that what is laid out be as frugally expended as possible. When the landlord is bound to lay out a specific sum, the tenant has little interest in economizing the expenditure. But in this case, their mutual interests harmonize.' p. 132, 133.

On the subject of Farm-Buildings, as on most other topics connected with agriculture and rural economy, general rules must always be of a very limited application; and the deviations occasioned by views of local utility and individual interest, combined with the circumstances of the contracting parties, must ever be numerous and diversified. In ordinary cases, certainly the houses and fences necessary for the profitable occupation of the land, should be provided by the proprietor. Our law considers them as attached to the land, and they pass along with it to the proprietor at the expiry of a lease, even though they have been built entirely at the expense of the temporary occupier. The tenant is not even allowed to pull down such erections, but must leave them in complete repair, without having any claim upon the landlord for their value. Though for these reasons the landlord should almost always incur the expense of these buildings; yet, at the same time, it is easy to conceive cases where the tenant may find it for his interest to bear a considerable part of the burthen in the first instance, for which the length of his lease, or the diminution of his rent, may fully indemnify him. A great share of this burthen has, in fact, been borne by the tenantry of the best cultivated districts. Yet, generally speaking, it is never the interest of the proprietor to transfer this burthen from himself to those who have only a temporary interest in his property, because the houses will, for the most part, not only cost him more, ultimately, than if he had expended the money himself, but because it is not to be expected that they should be equally durable as if the work had been executed under his own direction. Common prudence on the part of the tenant, demands his attention to the outlay that may be required for his comfortable accommodation in respect to buildings, as well as to the expense that may be necessary for the improvement of the land itself; and, if he must improve both with his own money, he will only offer such a rent as may enable him

to do so, not only without loss, but with a fair profit on his capital. Besides, the risk which he runs of ultimate repayment—the difficulty, often, of obtaining capital sufficient for expensive buildings, at a time when considerable outlay is usually required for the improvement of the land—and the uncertainty of his continuing in possession after the expiry of his lease,—are circumstances which seem to entitle the tenant to a high rate of interest for the money expended for his own immediate accommodation, at the very same time that it may not be expended to the greatest advantage for the proprietor.

Proprietors, for the most part, seem very sensible of all this, and find they can obtain a rent so much higher for a farm with good houses, than for one without them, that they are usually willing to advance the whole, or at least the far greater part of the necessary expense themselves. This sum, however, is often so considerable, that it has been thought adviseable to distinguish between the rent of the land and that of the houses, and to charge a percentage upon the money laid out on buildings. Whether this separate estimate may not be sometimes imaginary, it is not necessary to inquire. The only instance in which it seems at all of any consequence to either party is, when no specific plan has been fixed upon at the time the terms of the lease were settled. If the landlord must advance what money the tenant thinks necessary, as in the case stated in the preceding extract, then it is obviously proper to check the exercise of this right by a stipulation for interest. Yet it would be still better, perhaps, that neither the landlord nor the tenant should possess any such right, and that the buildings should be erected both at the expense and under the direction of the proprietor, according to a distinct plan referred to in the lease, from which no deviation should be made but with mutual consent. Both parties would thus know what they had to give and to receive; and there would be little or no danger of inconsiderate profusion by yielding to unreasonable claims, on the one hand, or of injudicious economy from a wish to diminish the amount of interest, on the other.

With regard to the rate of interest, we certainly do not agree with our author; though, by vesting the tenant with a right to regulate the expenditure, his opinion is somewhat less objectionable. It may be true, that houses in towns sometimes return 7 or 7½ *per cent.*, though more usually not so much;—6 *per cent.*, we understand, is counted a high enough rate for a new house. But then the proprietor of houses in towns almost always keeps them in repair at his own expense; at least the tenants of such houses are never called upon for such repairs as fall upon

the farmer, both during his lease, and at the end of it. If this be too high a rate for the landlord to demand, it is on the other hand also too high for a farmer to pay. The interest must be paid for his barns, stables, and other offices, as well as for his dwelling-house. It is obviously for the advantage of both parties that these offices should be complete and substantial, merely with a view to the value of the farm itself: and a too rigid economy enforced by this high rate of interest, must operate as a real diminution of that value, both to the present and to future occupiers. If the expenditure is sufficiently liberal, the addition to the rent must be a very serious consideration, which, if not calculated upon at the time of fixing the rent, with greater accuracy than usual, must cut very deep into the profits of a business, which is not believed to return more than 10 *per cent.* upon capital. It is much the same as if a tenant was to pay 7 or 7½ *per cent.* for money borrowed for the improvement of his farm.

Whatever may be the terms upon which the houses are built, and whether at the expense of the landlord or tenant, or partly of both, it is a matter of considerable importance, and of some difficulty, to ascertain, with tolerable precision, what are the obligations on the tenant with regard to repairs, both during the currency of the lease, and at the expiry of it. The opinion and practice of inspectors, we believe, have not been uniform on these points; and the clauses of the lease which specify these obligations, admit of much latitude of interpretation. The question is deeply interesting both to the proprietor and tenant. With regard to valuations at the beginning and end of a lease, we agree with the author in thinking them objectionable, and injurious to the interest of the landlord. The following remarks are well entitled to the attention of both parties.

'There is a general complaint among the farmers, against the 'backwardness of landlords, in affording them the necessary ac-'commodations in respect to houses and offices. Upon several pro-'perties this complaint is but too well founded. People, by adver-'tisements in the newspapers, are induced to bid against each other 'for a farm, without ever thinking whether the accommodations be 'sufficient to enable them to do justice to the farm, and to pay the 'rent. After the successful candidate is preferred, he finds there is 'no allowance for necessary buildings or repairs. He is therefore 'under a necessity of sinking part of his stock, and diverting a great 'part of his labour, in making such unsubstantial additions and re-'pairs to the buildings as may enable him and his cattle barely to 'exist. After all, he and his cattle are perpetually wallowing a-'mong filth; while his implements, from want of proper shelter, 'are exposed to rottenness and decay. It is not possible that a man,

'in such a situation, can do proper justice to his farm, or raise it 'to the highest possible state of production. Damp, nasty, and 'unwholesome habitations, depress the spirits, and enfeeble the ex-'ertions, not only of man, but of brute animals.' p. 134.

In chapter Fifth, which treats of the mode of occupation, the author seems to have stated facts with great accuracy, and to have reasoned from them with judgment and precision. Instances of both, we think, may be perceived in the following extract from the section on the size of farms.

'Number of farms, in the year 1808, whose rent is under 20*l.* per annum	1574
'Number of do. from 20*l.* to 50*l.* per annum	565
'Number of do. from 50*l.* to 100*l.*	682
'Number of do. from 100*l.* to 300*l.*	315
'Number of do. above 300*l.*	86
'Total number of farms	3222

'Much controversy has taken place among political economists, 'concerning the particular size of farms, which is most advantageous 'to the public. One party cries out against the enlargement and en-'grossing of farms, as tending to depopulate and ruin the country; 'and they call loudly for legislative regulations, which may counter-'act the mischief. Another party insists, that the enlargement of 'farms tends to render them more productive, and to furnish a great-'er amount of disposeable produce for feeding those who are engag-'ed in manufactures and trade. They therefore call for regulations 'of a contrary tendency, which may discourage small farms, and in-'crease their extent. But it appears to us, that the soundest policy 'consists in leaving these matters to regulate themselves. The size 'of a farm must be regulated by the skill and capital of its occu-'pier; and a corn farm does not admit of being extended beyond 'what the farmer can conveniently superintend. If too large, a 'great part of the time and labour of his working stock must be 'consumed in travelling to and from the distant extremities, and in 'the distant conveyance of the manure and produce. If too small, 'the horses and bestial will eat up a great part, if not the whole of 'the produce, and the farmer will be in a worse condition than a 'day-labourer. It is true, indeed, that were the country subjected 'to that sort of culture which prevails in China and Japan, which is 'more correct than that of the finest gardens in Europe, and is 'chiefly executed by the hand, every man might become a farmer, 'who could get possession of a spade and a few trifling implements. 'But in the present situation of things in this country, where a man 'depends entirely upon his farm, without other sources of income, 'it must be disadvantageous to have one smaller than will afford 'constant work to a pair of horses, with a suitable proportion of 'labourers, either constantly or occasionally employed. The con-

'flicting interests of landlords and tenants will always regulate 'the size of farms, more for the public advantage, than any re-'gulations that can be framed. It is the landlord's interest to 'shape his farms so as to answer the demands of the greatest part 'of his customers, the farmers; and so as he may obtain the highest 'rent for the same extent of surface. The interest of the farmer, a-'gain, consists in not taking a larger farm than he has capital to stock 'sufficiently, and skill to manage properly. Accordingly, in this 'county, farms below 150*l.* rent, have many more competitors, and 'are understood to bring a higher rent in proportion, when they fall 'out of lease, than those above this extent. The reason seems ob-'vious, That there are a greater number of competitors, or of per-'sons qualified to stock and manage such farms, than those of a 'greater extent.' p. 215–217.

At page 223, there is a pretty full detail of the vexatious services required from tenants in former times; and we fear they are not yet fallen into disuse in some parts of the Highlands. It is accompanied, as might be expected, with expressions of just and severe reprehension. In the section on Tithes, his sentiments are equally judicious and liberal. Indeed, the whole of this chapter may be perused with advantage by every proprietor and farmer in the island.

The following account of a local practice in reaping the crop, deserves to be more generally known.

'But the mode which is now most generally adopted, and which seems 'peculiar to this part of the kingdom, (at least I never observed it any 'where else), is that which is known by the name of *threeving*. This 'is an excellent mode, and is likely to become universal over the king-'dom. The farmer pays the reapers what sum they can agree upon 'for cutting down each threave, consisting of twenty-four sheaves, or 'twenty-eight sheaves, if necessary, for wheat. The price of this va-'ries from 2d. to 6d. and sometimes more each threave, according to 'the quality of the grain, and according to the number of competitors 'who offer their services. If the farmer furnish a man to bind and stook 'the sheaves, (and one man is necessary for every six shearers), the price 'is lower than when this work is performed by the reapers themselves. 'This is sometimes done; but in general, different parts of a field are 'undertaken by families, or by persons nearly connected, who bind and 'stook, and gather all the ears that may have dropped, on returning to 'the side where they began to cut down. Here it is the interest of 'the reapers to cut as close as possible, because they know, that the 'lower ends of the stalks fill the sheaf better than the upper parts; 'and also as clean as possible, because thereby they make the more 'sheaves. All that the farmer has to do, is to count the number of 'the threaves; and he is furnished with an iron fork, fastened on the 'end of a pole, about ten inches wide, which the sheaves must fill at 'the bands, or they are rejected as deficient in size. The reapers sub-

'fist themselves; and young and old, even mothers who are incumbered with infant children, devote as much of their time to threaving as their strength, or other avocations will admit. Since this mode was adopted, it has been ascertained, that women are, in general, more expert at this kind of work than the men. Many of the former have been known to earn 20s. a-week by threaving, while the men seldom earn above 18s.' p. 316, 317.

There is a separate section on the 'Breeds of Plants,' to which Mr Headrick advises that the same attention should be paid as to the breeds of animals; and he illustrates the advantages of the measure, by very appropriate allusions to Swedish turnips, and Blainslie and Potatoe oats; and also by an experiment of his own with potatoes, of which he gives the following account.

'In illustration of what has been stated, it may be mentioned, that, many years ago, I selected three potato plums from the same item. Early the ensuing spring, the seeds of these plums were sown in well manured garden ground; and as soon as the plants which sprang up, could be handled, they were planted in drills, of the usual distance, in the same garden, the bottoms of which had abundance of well rotted horse-dung. A considerable produce, little short of a boll, was raised the first year, part of which was consumed in trying experiments on their quality, which was remarkably good. There were no less than five different sorts of potatoes, evidently distinguishable by their shape, their eyes, their colour and spots; beside their appearance on slicing them longitudinally, or across. There were also several other varieties, whose characters were more dubious. I directed that each sort should be planted separately, the ensuing spring; but, in the hurry of work, they were all planted promiscuously. This was continued during several years; when the several sorts could be distinguished by the colour of their stems and leaves; but especially by that of their flowers. They continued to yield a more abundant, as well as a more palatable produce, than any other potatoes then cultivated in the parish of Cambuslang, near Glasgow; until, at last, they degenerated into one sort, which was inferior, both in quantity and quality, to the other potatoes cultivated in that neighbourhood. This induced their relinquishment as seed; but I cannot account for the rapid degeneracy of these potatoes, except from the promiscuous intercourse of their flowers while they were planted, without each sort being separated from the others. Yet this experiment (which I can warrant as authentic) goes the length of proving, that new varieties of potatoes may be produced, by raising them from the seeds formed in their plums or *bullets*, as they are usually called in this county. I would also beg leave to suggest a very probable inference from the premises,—that were those varieties whose produce is at present most abundant, most palatable, and most

'nutritious, by containing the greatest proportion of starch in the 'same weight, to be selected and cultivated apart from all other 'plants of the same species, great improvements in the breed of 'this useful plant might ensue. Were the breed to be occasionally renovated from the seed, it is hard to say to what perfection this 'useful root might be carried. As Spanish America is now more 'open to European intercourse than formerly and M. Humboldt 'describes some sorts of potatoes, of much larger size, and both 'more palatable and nutritious, than any yet known in Europe, 'which are cultivated on the higher Cordilleras of the Andes, under 'a climate not much warmer than our own; it would be advise'able to procure and try some of these sorts in this country, and 'then to keep up, or to improve their breeds, by the means which 'have been suggested.

'As I have no desire to shine in borrowed plumage, I think it in'cumbent on me to state, that the first hints of what has been offer'ed concerning the breeds of plants, were derived from my worthy 'and ingenious friend Dr Coventry, Professor of Agriculture in the 'University of Edinburgh. He has collected a great variety of 'authentic facts on this branch of rural science, which are both cu'rious and interesting; and it would highly promote the 'public 'good, were his numerous avocations to admit of his completing 'his investigations, and communicating the result.' p. 357–359.

On the subject of plantations—the superiority of the larch to the Scots fir seems to be very great. Besides defraying the expenses of planting and enclosing, together with interest of money while it is in advance; an acre, planted with larches, is estimated at the end of forty years to be worth 487*l.* 10s., or to yield 12*l.* 8s. 9d. of annual return for each acre. No land, whether in grass or tillage, makes nearly so great a nett return. Scotch firs, it is said, do not return above 25s. or 30s. per acre annually, after defraying all expenses with interest. It is no wonder, then, that the larch has been substituted for the Scotch fir, in all the later plantations of this county. But larches are liable to diseases, and to the depredations of small black insects, which either occasion their decay, or are attracted by it, and accelerate its progress. In this county the plantations are said to extend over 20,764 Scotch acres, and are annually increasing.

It is well known to be a favourite maxim with a large, active and generally intelligent class of our population, that the prices of provisions should be kept down as far as legislative enactments can have this effect, in order that the wages of labour may be always so low, and our manufactures produced at such a price, as may enable our merchants to compete successfully in foreign markets. They contend for an unlimited importation of grain, and against the use of it in the distilleries, even after a most abundant harvest, without considering that it can be raised cheap-

er in every other country than in Great Britain,—that when the price will no longer remunerate the British farmer, he must cease to produce grain, and leave the foreign cultivator in possession of his own market—that this dangerous and (while there are such large tracts of our own country capable of cultivation) disgraceful dependence has been experienced for a great many years, during which the prices of all sorts of provisions have steadily advanced, and have sometimes reached an unprecedented and alarming pitch—that a small portion of the vast expenditure for foreign grain, which has occasioned so much distress both to government and the public at large, would have long ago improved every acre of our wastes, and still farther enriched our best arable lands—and that the consequences would have been a great increase of population and of revenue; while upon their own principles, the wages of labour must have been always moderate, and poor-rates greatly reduced, owing to the abundant produce of food from our own soil. No economist will now assert, that the produce of Britain and Ireland, either in grain or butcher meat, must always be inadequate to the supply of the demands of the population, and that we must *necessarily* depend on importations of corn from America and the Continent of Europe.

In the greater number of the Reports of the Scottish counties, it has been distinctly stated, that the wages of labour are by no means regulated by the price of corn; and they have appealed, from an ingenious theory, to facts which cannot be disputed. The late Mr Burke, in his Thoughts and Details on Scarcity, (3d edition, 1800), has clearly proved that the wages of labour never have been, and in opposition to the absurd proposals of that time, never can be, so regulated. The rate of wages, he observes, 'has in truth no *direct* relation to the price of provisions. Labour is a commodity like every other, and rises or falls according to the demand.' Indeed it is matter of daily observation to every man who is old enough to recollect the condition of the labourers of Scotland 40 or 50 years ago, and who compares it with their present condition, that the wages of labour are not only nominally higher, but that the real reward of labour is much more liberal than it was at the former period. Labourers are evidently much better fed, clothed, lodged and educated at the present time, because the price of labour has risen in a considerably greater ratio than that of grain, and a smaller proportion of it, than before, suffices for providing food. So far from this rise of wages being a just subject of complaint, it is a proof of the increased prosperity of the country; and whether the improvement in the condition of the great body of the people is considered as it affects the interest of the public or of individuals, it must be a ground of exultation to every humane and enlightened mind.

But though the wages of labour in Scotland have risen beyond their former proportion to the price of grain, there have been, no doubt, temporary and local fluctuations which have pressed with great severity on the labouring class. Unfavourable seasons and a stagnation in any great branch of manufactures and commerce have raised the price of grain to an enormous height, and depressed the wages of labour so much, as to derange for a time the usual relation between them. Whether therefore we consider the gradual and steady progress of improvement for a number of years, or the occasional interruptions which have been experienced, we shall be led to conclude that the price of grain does not regulate the wages of labour in this country, and unless perhaps in a society absolutely stationary, that there is no definite relation between them.

It is gratifying to find that these sentiments are in unison with those of this author.

'It has been a subject of controversy among political economists, whether the wages of labour be regulated by the price of provisions. No doubt a labourer must get what is sufficient to maintain himself and family, or it is impossible he can labour long. But though the price of provisions may be supposed to have some influence upon the mind of the labourer, when he engages his services, it cannot be supposed to weigh much with his employer. In former times, in this country, a labourer was thought to be very well off, if he gained a peck of oatmeal, or its money price, by his day's work. Now, labourers generally gain the price of two pecks of meal, or more; and we must infer that the price of provisions has not all the influence on the price of labour, which some suppose.

'The depreciation of the value of money must be held as one cause of the great rise of the money price of labour; but this rise is more apparent than real. It is true that the meal, on which the labourer chiefly subsists, has not risen in the same proportion that the power of money has fallen, and in this particular the labourer has gained an advantage. But he needs clothes, shoes, and other articles of manufacture, as well as food; and the price of these has risen in proportion, or has even exceeded the diminution of the power of money.

'But the most operative cause of the great rise of the wages of labour, has been the demand for men to the army and navy, for manufactures and trade, and for agricultural improvements, which have been progressively increasing during a considerable time past. If there be many labourers seeking employment, and few who are desirous of their services, the wages of labour must fall. But if the employers be many, and the labourers few, their wages must rise. Thus the price of labour, like that of other commodities, will be regulated by the quantity in the market, compared with the demand.' p. 497, 498.

The 15th, and last Chapter or Book of this Report 'on Political Economy, as connected with or affecting Agriculture,' exhibits a full view of the various subjects usually appropriated to that division; and besides such details as are merely of local application, it contains many remarks of a general character. In the section on Population, the number of inhabitants, in 1811, is stated to have been 107,578; and the extent of the county being 831¼ square miles, there were 129.37 persons to the square mile, or nearly 5 English acres for each, of which about 3½ acres were in cultivation. Though we have already extracted largely from this work, we cannot resist the temptation of adding one extract more, which, in a few lines contains more good sense than some splendid quartos, which for a time attracted so much notice. It seems to be really as judicious to 'use suitable exertions' for the increase of food, as to repress the increase of the human race. And until it can be shown not only that the soil of a country is improved to the highest possible degree, but that the produce of the labour of its inhabitants cannot be exchanged for food with other countries; any bad effects that are supposed to arise from excessive population, must be attributed to an oppressive government, and the unequal distribution of food occasioned by an unnatural structure of society, only aggravated at times by the inclemency of the seasons. It is not improbable, notwithstanding the dense population of China and Hindostan, that the possible produce of the soil, is greatly beyond the demands of its present inhabitants, and that if these countries were blessed with such a government as that of Great Britain, a temporary scarcity would never be heightened to an actual famine. In truth, there seem to be, in a well regulated society living under a free government, principles, powerfully and constantly operating, which render excessive population almost a moral impossibility. Independent of every other check, the natural ambition of every one to improve his circumstances, at least, to avoid falling beneath his original condition, must always silently, yet effectually operate in restraining any such excess, which must be felt to press upon individual interest, long before it can become a national evil.

'Another question has much engaged the attention of political economists, namely, the causes which occasion an increase, or diminution, in the numbers of the human race.—There can be no doubt but the human race, like all other animated beings, will always multiply or diminish, in proportion to the quantity of food, and other necessaries of life, that are within their reach. A country such as Holland was, before it sank under the despotism of France, may sustain a very dense population, which all that the country produced was insufficient to sustain during three or four months. But by the Rhine, and other

'rivers, they communicated with the most fertile provinces of Germany, 'and not only became a great granary for supplying themselves, but for 'exporting provisions to other nations; and they enjoyed a great naval 'commerce, by which every production of the sea, and land, was open 'to them. Countries, such as China and Japan, support an immense 'population, without any foreign commerce, because the land is sub-'jected to a more correct cultivation than the finest gardens of Europe. 'By navigable rivers, and canals, a very great internal commerce is also 'carried on in China, and the products of one district are exchanged 'for those of another.—Some political economists wish to throw dis-'couragements in the way of the multiplication of the human race, lest 'their numbers should exceed the means of subsistence, and they should 'die of starvation. This project is only applicable to the inferior ani-'mals, who never increase the means of their subsistence; and when 'these are exhausted, if left to themselves, they must starve. But hu-'man skill and labour increase the productiveness of the earth and sea, 'and provide an addition of food, more than sufficient to sustain the in-'crease of numbers. Of this we have an example in this county, whose 'population has increased more than a half since the year 1755, and yet 'all ranks of the people are more affluently fed; are better clothed and 'lodged, than they were at that period. Still there is a greater surplus 'of provisions exported, than in former times. This shows, that in-'stead of checking the natural tendency of mankind to increase and 'multiply, it would be much sounder policy, to use suitable exertions 'in order to render every acre of land as productive as possible; and to 'occupy those extensive fisheries that have been abandoned by the 'Dutch. Britain never can be secure while she depends upon the ca-'price of other nations, or of their rulers, for the means of subsistence.' p. 559-60.

After what the reader must by this time know of our author's sentiments, it is almost unnecessary to add, that he very properly censures the present Property tax on the occupiers of land; disapproves of giving a preference to the West Indian farmer over the British farmer, by substituting sugar for grain in the distilleries; and recommends a revision of the corn laws.

The Appendix consists of 11 Articles, among which are, an account of the Bell-rock light-house, and other interesting papers. At p. 79. there is a curious minute of the Proceedings of a Barony Court, which may give some idea of the abuses that prevailed in Scotland before the abolition of heritable jurisdictions. The heritable proprietor and baron, names as baillie or judge, one of his tenants or domestics, a clerk of court, and an executive officer; and then gravely lays before this worthy magistrate his own complaints against his tenants and vassals, and sentence is forthwith pronounced according to law. These proceedings were held so late as the year 1742.

Having finished the perusal of this work, we cannot avoid expressing our satisfaction with it, and our gratitude to its

author; and we are convinced that there are few readers who will not find it both interesting and instructive. The actual circumstances of the county seem to be stated very accurately, so far as we can judge, as well as very fully, except what regards the linen manufacture, which has greatly declined of late years; and the accompanying remarks and deductions evidently proceed from a liberal and reflecting mind. At the same time, it must be admitted, that the Reverend Author digresses rather farther, and oftener, than a cynical reader will be disposed to excuse. A greater fault in our eyes is the want of an index and appropriate title page, which seem very necessary in a work of this length.

ART. II. *A New Essay on Fiorin Grass, including the History of its Discovery, and an Account of its valuable Qualities, and mode of Culture.* By WILLIAM RICHARDSON, DD. London, Harding, 1813. pp. 91.

Dr R. is certainly one of the most persevering, indefatigable, and patriotic characters of the present age. It is very fortunate for the world, that a discovery of such importance as that of fiorin should have been made by such a gentleman. There are very few, indeed, who would have encountered, with so much disinterested zeal and fortitude, the host of enemies that have assailed him; and scarcely any that could have acquitted themselves with so much ability. Like some other great heroes, he does appear at times to be a little irascible; but that is not to be wondered at, when it is considered that 'he has been attacked from all quarters; and, while his fiorin was only gaining 'ground by inches, he had as many battles to fight in support 'of this native vegetable, as Henry the Fourth had to engage 'in for the recovery of his hereditary kingdom.' So much paper indeed has been expended in these numerous conflicts, and so true it is, that, after all, fiorin has only gained ground by inches, that it is not improbable the whole of the crops in Scotland might be covered by the learned and unlearned essays, letters, and dissertations, that have been written and printed respecting this wonderful grass;—a melancholy proof certainly of the obstinate prejudices of mankind against every new discovery, however valuable. And yet we must say, for the honour of our country, upon the authority of Dr R. himself, that we are much more open to conviction, and much more tractable, than our southern neighbours.

Concerning several late discoveries, such as the culture of

wheat in the Highlands of Scotland, the inexpediency of summer-fallow on heavy soils, and others of the same kind, a difference of opinion still prevails; and, with regard to the notable expedient of reducing the several breeds of live-stock to a single breed, the difficulty of providing a sufficiency of winter food in many parts of Scotland appeared to be almost unsurmountable. Red clover and rye-grass will afford but a poor crop on the bleak heathy mountain; and neither turnip, nor even ruta baga, are found capable of resisting the successive frosts and thaws of our severe climate, even if it were possible to raise good crops of them in such situations. Hence any kind of herbage that would supply the place of hay and succulent food in our mountain districts, must always have been a most important desideratum.

When it was said, a few years ago, that the most barren moors and mosses could produce such herbage, and that there was a native vegetable to be found every where, which, upon such land, would yield a crop of hay thrice the weight of that of the best meadows of England, and of a far superior quality, it was naturally to be expected that farmers would be somewhat incredulous. But now that the fact has been ascertained, and indeed 'demonstrated' by Dr R., it is quite unaccountable to find men still exclaiming against a discovery for which they had long wished, and against a crop, from the want of which they had felt much loss, and always very serious inconvenience.

It would have been our duty, long ago, to have laid before our readers some very excellent specimens of controversial acumen on this subject, had it not appeared to be more 'decent and honourable' (to adopt the words of our author) 'to leave the projector a 'clear stage, and a fair opportunity to make his own way.' As he very judiciously adds, 'if his discovery was nothing, and his 'schemes futile, the world would soon detect him, as they have 'already so often of themselves detected and ridiculed the puffed discoveries of pompous charlatans.' But it is now full time that the benefit of our author's discovery should be extended over every part of Scotland at least, and that we should contribute our mite for that purpose. If our English readers should still remain obstinate and perverse, they have only themselves to blame for the consequences.

The first questions that it seems natural to ask about this grass regard the discovery of it—its properties—the amount of its produce—and its application.

Second, It must be desireable to know upon what soils it will prosper, and how it should be cultivated.

Lastly, What are the peculiar advantages to be obtained from its culture to individuals, in the first instance, and ultimately to the public at large?

In arranging and condensing Dr R.'s observations, under these several heads, it may be necessary to notice, very shortly, the objections that have been made to his statements; and also the omissions, which it may be readily believed will often be chargeable against a writer whose mind is too much occupied with leading topics, to suffer him to attend to minute details.

To the *discovery* of the valuable properties of this grass, our author positively lays claim, and gives a full account of the steps by which he had acquired this knowledge. These properties, he observes, 'had escaped the attention of man for five thou-'sand years.' This discovery, too, 'of which the world be-'gins now to feel the importance, was not the result of acci-'dent, or a *lucky hit*, thrown in my way by good fortune, but 'the very thing I was in search of.' Notwithstanding this, the Doctor admits, that 'the aborigines of the British isles 'seem all to have had some vague notion of the value of fiorin;' that it was not 'unknown to the botanical writers of the seven-'teenth century;' that 25 years ago, 'the Reverend Marcus 'M'Cousland, descanting on the value of a piece of ground he 'had recovered from the sea,' exclaimed, 'See, it is all fiorin!' and that the natives of the wild parts of Donegal, always charg-ed a higher price for fiorin hay, though spontaneous, than for that made of other grass. All this time the Doctor did not even know it. He had taken pains, about eight years ago, to procure some plants, but did not succeed; and at last found a tenant who said he knew the grass. 'I went with him to my 'bog, where he showed it to me in abundance.' After some experiments with nine roots raised from this bog, the author laid down a rood with fiorin, after a crop of potatoes, on the 15th November 1806.

It is not our business to reconcile these accounts. One thing cannot be disputed. The Doctor has the merit of having first discovered that it was infinitely more valuable than any other grass, and than any other person seems ever to have imagined, or will yet believe. Mr Wakefield, in his late account of Ire-land, not only denies the author's right to this discovery, but that he was even the first cultivator of it; and refers to the sur-veys of Tyrone and Derry, to prove that it had been previously cultivated by Mr M'Evoy, and the Reverend Mr Samson. In reply to this, our author very liberally abuses Mr Wakefield, and seems to withdraw his pretensions.

Be this as it may, it is of more importance to be able to dis-tinguish this grass from every other; and, to all appearance, this is no easy matter. 'The slightest assistance is not to be de-'rived from botanical books;' and, in the whole of this Essay,

there is not a word of description to enable the reader to select the fiorin cultivated by Dr R. from other stoloniferous grasses. At one time, his directions to those who sought for fiorin stolones, were, 'to raise the grass growing in contact with the north 'wall of their parish church, telling them they would find it to 'be fiorin.' But this simple expedient must not be depended on for success, now that it appears from Sir H. Davy's experiments that there are at least two varieties;—the *latifolia*, cultivated by Dr R., and the *angustifolia*, of much less value.

Respecting its *properties* also, the information is not quite so full and satisfactory as might be wished. It would have been of importance to know the weight of it consumed by horses and cattle, that it might be compared with that of other hay; and particularly, whether horses enjoy the same health and vigour when fed on dry fiorin, as on good clover and rye-grass hay. Yet a vegetable, which possesses the properties ascribed to fiorin in the following extracts, must be of extreme importance.

'See the contrast—our native fiorin has no disorders, no enemies; 'the vicissitudes of season make no impression upon it; and this 'hardy grass vegetates in the severest frost; its stolones continue to 'lengthen under the snow; deluges of rain do not in the least injure 'it; and if Nature has thrown its period of perfection into the win-'ter season, she has had the kindness amply to compensate, by mak-'ing both the plant and its enormous crop equally insensible to the 'severities attendant on the season. And though we cannot accu-'mulate a fiorin crop in the short and moist days of the brumal 'months, we can consume it to the greatest advantage in that pe-'riod; and should we mow more than we can use, we know that 'fiorin grass will remain on the ground without injury, until the 'lengthening day brings sufficient drought to enable us to convert 'into excellent hay, both what was cut, and what was left uncut 'through the winter.' p. 25.

'During the time I was thus endeavouring to ascertain the extent 'to which fiorin culture might be carried, I was equally diligent in 'trying the various modes in which it might be applied to use in 'rural economy. I soon discovered that either dry or green fiorin 'enriched the milk of the cows fed upon it, more than any other 'food I had ever tried, and that its fattening powers far exceeded 'those of any other hay; that as a green food, its value was incal-'culable, coming in aid of the soiling system early in September, 'and continuing a most luxuriant and succulent food, even until the 'middle of May.' p. 19, 20.

There is nothing, one should think, can be better ascertained than the *amount of its produce*:—for a great number of high authorities, high at least in point of rank and general knowledge, have been adduced: and his people have been examined on oath respecting its weight and other circumstances.

'The following statements of quantity of fiorin crop, are established with precision, viz.
'1808, Seven ton, four hundred, one quarter, four pounds.
'1809, Eight ton, five hundred, two quarters, twenty-four pounds.
'1810, Season so desperate, never weighed.
'1811, Eight ton and upwards.'

From this and other statements, the Doctor infers 'that fiorin grass produces treble crops of hay,—that at least is completely established;—as, of 6 crops carefully weighed, every one of them far exceeded treble the highest average ever made from a hay crop.'

The only objections that have been made to this inference are, that others cannot raise such great crops, not even the half of these weights; that fiorin grass does not 'produce' hay at all,—though it is perhaps something better; and that it is absurd and fallacious to compare a crop produced in 6 or 8 weeks only, with one which requires to occupy the ground for a whole year. It has been said, with some appearance of reason, that the author should have brought into view the early spring food obtained from meadows and artificial grasses, and also the second and sometimes third crops after the hay crop, or the value of the pasturage till the fields are again shut up for hay, or ploughed for a crop in March. Fiorin gives neither early pasture so valuable for ewes and lambs and fattening stock, nor a second crop which may be either cut for hay or soiling, nor any after eatage, like the land which produces the hay with which it is compared.

The *application* of the author's crops is nowhere distinctly stated. One cannot but wish for particulars on this head. How many horses, cattle and sheep does he support from a given quantity of land under fiorin? The weight of the crop is of itself no criterion of value. Of this succulent food perhaps twice the weight of hay is consumed.

In the second place, it must be desireable to know upon what soils fiorin will prosper, and how it should be cultivated.

With regard to the kind of soil, it seems to be of no consequence whatever. The Doctor has raised excellent meadows on miry bog, so wet, that he describes it, in Ovid's words, as being '*Instabilis terra, innabilis unda.*' It grows spontaneously on dry sandy grounds, with so much vigour, that he has recommended its cultivation on the blowing sands of the Hebrides, as an excellent expedient for preventing the destruction of the contiguous land, and at the same time converting these blowing sands into better meadow than any in England. There is very little concerning the mode of cultivating it in this Essay, which

in this instance does not very well accord with its title; but it has been already described in this and various other journals. The Doctor's rood laid down in November 1806, is 'light dry 'upland ground, and got a very weak top-dressing every year; 'always turf mold with a little ashes.' The sixth crop, mown in October 1812, was, like all the former ones, very fine.

The greater part of this Essay is occupied with a display of the vast advantages that cannot fail to be derived from this important discovery, both to individuals and the public at large; which was the last branch of our inquiry. Fortunately, on this point, there is little more to be wished for. It is now only necessary to consider its advantages in a national view; and here we must give Dr R. the merit of having made more of his premises, such as they are, than perhaps any other gentleman in the united kingdom could have done.

The Doctor's *first* object is to show, that 'it shall not again 'be necessary either to import grain, or export bullion;' but 'that we shall resume our former enviable description—a *grain* 'exporting country.' To establish this comfortable conclusion, the country is divided into land of three descriptions. The first includes 'boggy and miry ground contiguous to the farms or 'demesnes of proprietors.'

'The discovery of the facility with which these *now* unprofitable 'wastes may be made, at small expense, to produce crops of the 'highest value, will no doubt bring many of their proprietors into 'action; superabundance of hay will be the immediate result; what 'then becomes of the ancient meadows that have hitherto supplied 'Mr Miller, and the gentlemen of this description with hay? must 'they not be instantly converted into tillage grounds? and with the 'advantage of a profusion of manure, derived from the cattle fed 'from meadows which never require animal dung, ashes from the 'spot answering the same purpose. The immense addition to our 'grain crops that will arise from this source, must be obvious to 'every one, who has travelled through Ireland, Scotland, and more 'particularly the North of England.

'The *next* description comprehends the extensive grazing farms 'scattered through the mountain districts of our islands. The cattle 'fed upon these bleak pastures through the summer, are at present 'sold off, or sent elsewhere to find sustenance through the winter.

'But now since we became acquainted with this hardy vegetable, 'we know that we can make fiorin meadows on the cheapest terms, 'and to any extent, through every part of these dreary regions, 'which will not again be depopulated in winter, their cattle finding 'food within their own limits, in greater abundance in winter than in 'summer; and administered to them with the greatest facility.'

The *third* is by far the 'most important of the three descrip-'tions of ground,' and comprehends the cultivated farms spread

'over the whole face of our islands.' To introduce fiorin culture here, the author very judiciously considers, that two positions must be established—first, that fiorin 'produces steadily 'hay crops more than treble the amount of what we now mow 'from the same extent of ground.' Of this there can no longer be any doubt; for he assures us, 'that the *lowest* amount of an 'acre of fiorin he ever knew weighed, was seven load 200 lib. The second position regards the great value of fiorin, which is equally well established. These points being thus settled, 'Let 'us try the result, and see what effect is likely to be produced on 'the third description of territory into which I have supposed our 'islands to be divided; to wit, the mass of cultivated farms spread 'over England and Wales, stated to amount to 11,500,000 acres of 'arable, and 6,000,000 acres of meadow. Vast quantities of these 'meadows must rapidly be laid down with a new grass, admitted to 'produce treble as much hay as is afforded by the grasses now cloth-'ing our present meadows; and vast quantities of them must be ap-'plied to tillage, the proprietors being supplied with better and more 'abundant hay from one-third of the same ground. How much the 'eleven one-half million acres of arable will be augmented by this 'transfer, and how far the six million acres of meadow will be reduc-'ed, are questions to be answered only by conjecture.

'I am sure I make great concessions, if I admit one-third of our 'meadows to remain in their present state, after the proprietor is 'convinced that he has it in his power to treble their crops, and that 'one-third only is laid down with fiorin. We add then two million 'acres (the other third) to our tillage ground, and we increase our 'hay crop by one-third. Our tillage ground, 11,500,000 acres at 'present, is increased by more than one sixth; we can now throw 'some light on the subject, limiting ourselves to wheat. Other crops 'applicable to the food of man will no doubt be also raised; but I 'do not take these into consideration, leaving them out to make my 'general conclusion more secure.

'Mr M'Pherson makes the average produce of wheat in England 'and Wales 8,000,000 quarters; let us suppose the same proportion 'to hold in the two million acres we have added to our tillage ground, 'and we add annually to our present produce of wheat one-sixth, that 'is, 1,333,333 quarters of wheat. The average importation before '1797, was 400,000 quarters for some years; in 1799, 415,647; in '1800, it was 1,174,654 quarters; and in 1801, 1,186,236; thus it 'appears, that the quantity of wheat likely to be brought by the in-'troduction of fiorin grass into general use, is more than treble the 'average importation for many years, and exceeds the importation 'in either of the two years of famine, when it rose to an height it 'had never approached before. I fear the importations of late have 'been weightier; but I have not yet received a statement of them. 'Whoever attends minutely to my calculations, will find I have much 'to spare.

'Surely with the great addition I have made to our resources, 'we shall never be obliged to import another quarter of wheat, or 'to send one guinea abroad for food; no, but we shall soon resume 'our former enviable description—*a grain exporting country.*

'Let us try the question in another point of view. We have add-'ed two million acres to our tillage ground, and it is not unreason-'able to suppose each of these produces a crop of wheat every 'fourth year; for the meadows we transfer to tillage are our very best 'ground. Dropping then (as before) all consideration of other crops, 'we have thus made an annual addition to our wheat crops of '500,000 acres of wheat, which, at three quarters per acre, gives 'us a steady increase of 1,500,000 quarters, still more than the pre-'ceding amount.

'The approximation of these two results, tends much to confirm 'the fairness of each of them.

'I must observe, that although these results so completely esta-'blish my friend Mr Miller's position, as to the effects the introduc-'tion of fiorin grass must necessarily produce; yet they are dedu-'ced from but one of the three descriptions of ground into which I 'have divided our islands, viz. our present cultivated farms.

'The addition that will be made to our grain crops by the culti-'vation of fiorin on our peaty moors, upon which I have already 'dwelled, is not taken into consideration. Neither is the improve-'ment and extension our agricultural fields must derive from scatter-'ing meadows, clothed with this luxuriant grass, through all the 'dreary mountain tracts so profusely spread over Great Britain and 'Ireland, called in aid of my friend's position, "that it shall not a-'gain be necessary either to import grain, or export our bullion." p. 47–51.

Upon these very ingenious calculations and deductions and suppositions, it does not seem to be our business to offer much of remark. Unfortunately we have enough of 'miry boggy land,' and also of mountain tracts, but scarcely any meadow that can be converted into arable land. It was, therefore, very proper to confine the preceding statements to England, though it might have been as well to have begun with the wastes, instead of the meadows. If the English meadows are to be broken up, which is not a very probable occurrence, those concerned will no doubt be fully satisfied about the foundation upon which this splendid superstructure is to be reared—the treble crops and superior quality of fiorin. They may still, however, have to choose between a regular rotation of grain crops, and clovers and turnips, and a fiorin meadow one-third the extent of their present alternate meadows and pastures. They must also consider whether this diminution of their pastures will not occasion a scarcity of butcher-meat and dairy produce, to place against the su-

perabundance of grain. For fiorin, though it is said to be found in all our pastures, does not itself admit of being pastured—facts, like several others, somewhat perplexing and discordant.—Another difficulty occurs about manuring the fiorin every year. In Scotland, there is always both a grain and a cattle crop raised from one dunging, and more commonly two of each; on English meadows, first year, a hay crop, and the next year pasture. On the miry bogs and mountain farms, all that is necessary is to procure ashes, by burning the nearest wild land, or, according to the good practice of our forefathers, to enrich one spot by the ruin of ten times its extent; but this cannot well be done on 'cultivated farms.' The compost of dung, ashes, and lime, afterwards recommended, or the plain earth alone to be applied to the oak-land, are not always to be got; and if recourse is had to dung by itself for this yearly top-dressing, the land in tillage may be somewhat defrauded.—Besides all this, it might have occurred to Dr R., that the population of Great Britain will certainly increase with the increase of food; that there is no country to which a temporary surplus can be exported, unless by means of a large bounty, and therefore that no surplus will be produced; and that, much as the continuance of the late excessive importations may be deprecated, it is perhaps quite as 'enviable,' that Britain should continue to clothe other countries, as to feed them with her raw produce. Dr R., with a view to this point, may compare the condition of the labouring classes of England, which imports so largely, with that of those on his side of the water, from whence large exportations have been lately made.

A great many other beneficial effects would result from the cultivation of fiorin, which we have only room to enumerate. 1st, It would 'restrain the occasional enormous rise of the poor rates, by preventing the recurrence of scarcity and dearth. 2d, It would both maintain and employ our population. 3d, 'The increase of our agricultural population is a necessary consequence. 4th, 'The introduction of fiorin will make an era of much importance to the breeders and feeders of sheep,' and probably lead to a great improvement of wool. 5th, Fiorin is very proper for being distilled, and yields excellent spirits; and last of all, though not least, 'it shall now appear capable of contributing materially to our national strength and defence.'

'I little thought, when I was developing successively the different valuable qualities of fiorin, that I should discover this diminutive grass might be made an important friend to our Navy, and a useful associate in raising *oak* for its supply.

'The properties of the oak, connected with my plan are two—a

'distinct solitary stem, and great slowness of growth. Each of these is highly favourable to the measure I propose, that is, to 'make the same enclosure an oak plantation and a fiorin meadow; 'by the former the erect oaks will little interfere with the fiorin crop; 'by the latter, the proprietor will long enjoy the benefit of a valuable fiorin meadow.'

This brilliant conception is then illustrated at some length; but our limits for such an article have been already exceeded. Those who wish to know the value of coppice and standard reserves, and of the yearly thinnings of a mixed plantation, will find some information in the First Branch of this Number; and may choose between our author's fiorin, and either of these methods of rearing timber trees.

If we should now bring this article to a conclusion, we should probably disappoint the just expectations of many of our readers. Of this essay, then, we will say, that from beginning to end it is written in the language of enthusiasm; and the author either knows not, or spurns at the dictates of reason and experience. A very slight acquaintance with the most approved practices of modern husbandry would have convinced him, that there is very little room in it, for a plant, which can neither supply the place of old feeding pastures, nor of artificial grasses, nor of winter crops of common and Swedish turnips. From these lofty anticipations, let us turn to such facts as seem deducible from our present very limited experience.

We do not fear being contradicted by any person in Scotland, who has attempted the cultivation of fiorin, when we say that it is altogether unsuitable for arable lands. Should any farmer in the Lothians or Berwickshire, plant fiorin upon any considerable portion of land, capable of growing clovers or turnips, it would be held a decisive proof that his mind was fast verging to confirmed insanity. A few small patches of such land have been planted by way of experiment along-side of tillage crops; and it will not be easy to prevail with those who made these experiments, or with such as had access to inspect them, to make any new trials.

Upon dry sandy soils, of whatever quality, fiorin has produced a very insignificant crop. Some of the Scottish gentlemen, to whom the Doctor refers, will not hesitate to admit this. A piece of land, laid down in May 1812, under the Doctor's personal superintendance, gave a crop of about 3 tons per Scots acre of half-dried grass last year, and this year scarcely a plant was to be found. Another spot, carrying the first crop, which had been treated *secundum artem* by another of the Doctor's pupils, was inspected a few weeks ago. The crop was miserable

upon the high parts of the field, but not so bad at the bottom, where the soil was moist and deep. It might average about half a ton per Scotch acre, and was to be ploughed up as soon as the crop was removed. The same gentleman had another patch, carrying a crop of the third year, which at the end of September his servants were cutting for the stables. The ground appeared fully stocked with plants; the soil was a rich deep sandy loam, worth 3 guineas an acre. The crop last year weighed 150 Scots stones (1½ ton) per Scots acre; and it was estimated at the same weight this year. A third gentleman laid down 12 acres with fiorin, in a situation where he expected to have the command of water for irrigation. The water was not thrown over it in a sufficient manner; and though it got a good top dressing, the crop has altogether failed. It is needless to enumerate more instances of the same kind.

The only description of land where this cultivation has been in any degree successful in Scotland, is that with which the Doctor himself began his experiments—'miry bog.' Such land has certainly in some cases produced a great weight of this aquatic; and should it remain in the soil, of which one of the earliest cultivators now entertains much doubt, it must be considered as a most valuable discovery. Every thing that can be got from such land, after expenses are defrayed, may be considered as clear gain; and in those situations, where neither clover nor turnips can be raised, fiorin may probably be of very great importance as a succulent food for cattle in winter and spring. Wherever irrigation can be practised, there is reason to hope for the same result; though, where the soil is dry, meadows will be much more profitably occupied by such plants as give early and late pasture, with a moderate hay crop between them.

We shall only offer one remark more. There is no considerate person, who can read this Essay, without feeling a thorough conviction that Dr R. has greatly 'overstepped the modesty of nature,' and provoked opposition by his lofty pretensions. It is unjust to charge landholders and farmers with an indiscriminate and inveterate hostility to innovation. There is no class of society more open to conviction, nor more ready to adopt every new practice, which gives a fair promise of augmenting the value of their produce, than that of the farmers of the arable districts of Scotland. Fiorin has now been tried for several years; and such are the results. If they should be called in question, by those who really wish for information, and not for controversy, they can easily be referred to the places to which we have alluded, where ocular inspection will in a moment dissipate the illusions raised by a thousand pages of declamation.

BRANCH III.

Agricultural Intelligence.

From the publication of our last Number, until the 4th of October, the weather was remarkably favourable for harvest operations; and by that day the far greater part of the crop had been secured in the very best order. It has since been more variable; but there have been intervals of good weather, which have allowed the late part of the crop to be cut and stacked, with scarcely any injury. Little or no loss has been sustained from rotting rains or from shaking winds; and the crop, over the whole of the Island, is abundant in quantity, and of excellent quality.

There are, however, slight shades of difference in the subsequent Reports. *Wheat* seems to be every where above an average crop. *Barley*, though it has suffered from drought upon thin sandy soils, is not below an average; and *Oats*, notwithstanding the partial depredations of insects, and, in some situations, a deficiency of straw, give an abundant return, both in the number of boils, and in the weight of meal. The season has been very favourable for *Peas* and *Beans*, which are understood to be productive crops in grain. With few exceptions they have been stacked earlier than usual, and already a great part of the land has been sown with Wheat. *Turnips* and *Potatoes* suffered for a time from the long continued drought; but the former have greatly improved within these few weeks; and the latter, of which the cultivation has been much extended, are, in most places, fully equal to an average, and every where of good quality.

Cattle, which at one time experienced some depression, have been lately in great demand, and brought high prices. Sheep also have been readily sold at prices rather above than below those of last year, particularly such as were fit to go to turnips.

A great deal of Wheat has been put into the ground; and what was sown early after fallows, has now a very fine appearance.

Prices of all sorts of Grain have fallen rapidly, and still continue to fall. The present moderate rates, together with the revival of manufactures and commerce, that may be confidently anticipated from the late brilliant and decisive successes against the common enemy, must greatly improve the condition of the labouring classes; and it is to be hoped that the greater quantity of disposeable produce may amply compensate the reduction of price to the farmer. At the same time it may be doubted whether it is a wise measure to permit the still extensive importations from foreign parts, which may depress the price of British grain so much as to check those exertions of our own farmers, to which, under Providence, the country is chiefly indebted for the present happy abundance. Under the operation of the existing corn-laws, there is reason to fear that one or two seasons

of uncommon cheapness must be followed by a diminution of production, and a renewed dependence on foreign supplies. If the present spirit for improvement shall be encouraged by a duty on foreign grain, equal to the additional expenses of cultivation which must be incurred by the British farmer, there can be no doubt that our own produce will soon be adequate to our consumption, in seasons of ordinary abundance. This crop is probably above it; and Government have very properly declared, that the prohibition of the use of grain in the distilleries shall be at an end on the 1st of December next.

SCOTLAND.

Aberdeenshire Quarterly Report.

The fine weather which had continued throughout July and August mentioned in last Report, continued without any great alteration through the month of September; by which time the Wheat, the Bear, and all the species of early Oats, were fully ripened, cut down, and ingathered in full perfection. The common Oats, particularly those sown from the seed of the former year, being generally thin on the ground, kept longer green; and as the rains broke out about the 1st of October, the harvest was retarded for some weeks; but the whole is now secured in excellent order.

From the wetness of last season, a less proportion of Wheat was sown than otherwise would have been; the crop, however, is very full, and the grain excellent.

For the above reason, and the insufficiency of the Oats for seed, there was a greater quantity of Bear sown than for several years preceding; and, from the favourable season, this crop will be much beyond an average, both as to quality and quantity.

Oats, notwithstanding the thinness on a great extent of ground, are still a bulky crop; the quality very superior, and the quantity above an average.

Both the Potatoe and Turnip crops are excellent; the former taken up and secured in the most perfect manner.

The price of grain of every description has been lowering of late, as the supplies could be brought to market; but as there is scarcely any thing as yet purchasing for distant markets, it is impossible to quote prices with any degree of certainty. In the Aberdeen market, Oatmeal is from 20s. to 30s. per boll, as the supply brought forward happens to be great or small.—*Oct.* 29.

Upper Annandale Quarterly Report.

It is the general opinion, that the crop now in the stack yards has not often been surpassed in value, though the bulk has occasionally been greater. This has encouraged the farmers to exert themselves; and new leases having just been granted on some large estates in this district, vigorous efforts are in contemplation. It is remarked, that not a single farmer, from the Lothians or Berwickshire, has thought seriously of any of these leases. Field labour goes on apace; and most of the Wheat after Potatoes has been sown, while after plain fallow it has been verdant some time ago. The prices for

young cattle were never so brisk nor so high. Grain has fallen, as in other places. Turnips are commonly good crops; and the young sown grasses have planted thick and rich. The weather, on the whole, is favourable; and the pastures pretty good for the season.—1. *Nov.*

Ayrshire Quarterly Report.

We have seldom seen a better harvest quarter than this. The month of August was most excellent weather for bringing forward the crop—fine sunshine, accompanied with refreshing showers; and the month of September so mild, that the gooseberry bushes took on a new growth. Our grain, when laid, is in general to the east; but upon the 5th, a strong wind from the eastward, and a heavy fall of rain, laid the crop to the westward, which added considerably to the farmer's expense in cutting. On the 12th, a very heavy rain from the west raised the rivers, that carried off some of the crop from the holm land, and damaged more. It was not general; but some of the waters have not been seen so high these forty years. The river Air came down so rapidly, that it drove some of the ships out of the harbour, and damaged several bridges. The month of October, except a few days, was dry; so that the harvest was well finished, and the crop got into the barn yards in excellent order. There has been no loss either by rotting rains or shaking winds. The Oat harvest began about the first week of September, but was not finished till the last week in October. Seldom has there been so great a difference in the reaping of the crop between the lower part of the county and that part bordering upon the moors, as this year. Almost the one half was finished before the other half was well begun to be cut. The lower part of the county has not the appearance in the sheaf that it promised in the month of July. There is a scarcity of white fodder, and the farmers in general reckon, that they want a third of former years; but it is well filled, and produces well in the mill. The heaviest crop is in the high grounds, (the long dry weather not affecting them so much as the clay soil, drenched with the rains of May), but the Oats there are very full of greens: yet I think it will be an average crop. Wheat is an excellent crop; and the produce good. There never was in the county so much fallow for Wheat as this summer; and, from the dryness of the season, the land is well cleaned, and in fine tilth for receiving the seed. The Wheat sowing began the first week of September, which is earlier than usual; but the land being in fine order, the farmer would have been to blame if he had missed the opportunity. It has planted well, and in a great many places is covering the clod. I am something of opinion that grazing has not been a good speculation this season; grass parks were taken at a high rent; the inlay was high, and the pasture has not been like last year. The good housewives complain much of the early failure of their dairy. The sheep stocks in the moorlands never were in better order; and a fair price has been obtained;—stock ewes about 2s. a-head higher than last year. Prices of grain began to fall in August; and, since that, have been steady.

Oatmeal 3s. 8d. per stone Amsterdam; Mutton 9d.; Beef 8d. to 1s. retail, and 24 ounces to the lib.; Butter 25s. and 26s.; full milk Cheese 12s. and 12s. 6d.; and skim milk Cheese 8s. per stone wholesale, Tron weight, 24 ounces to the lib., and 16 lib. to the stone; Potatoes 9d. to 10d. per peck;—of them there is a full average crop. Agriculture is still making rapid strides; and a great deal of waste land breaking up. The lime-kilns were never better employed. Rents rising; and although taxes are heavy, no one is discontented; all are employed that are willing to labour; provisions plentiful; and the good news from our army and allies put a smile in every one's countenance.—29. *Oct.*

Banffshire Quarterly Report.

HARVEST in this county became pretty general about the 10th of September; but from unequal ripening, the business did not go on so rapidly as was expected; and also the mild state of the weather prevented the stooks long from being carried to the stack yard, with any degree of safety. From these circumstances, harvesting has been retarded much longer than might have been expected from its commencing so early. The crop is now, with the exception of a few fields of late Oats, all secured, and in very good condition; the weather continuing favourable till about the first of October, when it became very boisterous, with heavy falls of rain, and violent showers of hail, which did considerable injury to some fields of Oats remaining uncut. Individuals will of course sustain considerable loss, as the shake was severe; but as its effects were but partial, it will not be felt in the great scale. As to the crop in general, it may be reported as far exceeding the returns of ordinary years. Barley, or rather Bear, was of great bulk, and of excellent quality—far exceeding an average crop. Oats were in many instances thin upon the ground, and may not exceed an average as to quantity; but where well ripened, are producing more meal than for many years back. In many instances, common Oats are giving more than 8 stone Dutch per boll. What Wheat we have is entirely free of disease, and in every respect superior in quality to what is generally found in the district. Peas are so little sown, that they make but a trifling part of the crop. Potatoes are excellent, both in quality and quantity. The markets for cattle continued very brisk since the date of last Report; but prices have not advanced to make the summer trade an advantageous one to the grazier, but those who rear cattle have no cause to grumble. Prices for fat stock have kept steady at 9s. and 10s. per stone, sinking offal. From the appearance of the stack-yards, there will be abundance of keep for the remaining stock through the winter and spring months; and although the Turnips have not come to that weight they at one time promised, they are much about an average crop; and, from the abundance of Hay in the district, cattle may be expected to go to market at the usual period in excellent condition. Corn merchants have not begun to speculate. Barley is beginning to be inquired after, no doubt with the

expectation that the Legislature will allow distillation from grain, a measure certainly favourable to the farming interest, and ultimately so to every class of the community, when properly viewed. Some excellent parcels of Barley will be found in this county, very suitable for the distiller or brewer. Oatmeal sells at 20d. per peck, of 8 lib. Dutch, in retail. The quantity of Wheat sown this year seems much greater than ordinary; and from being earlier laid down, and the land in excellent condition, it is now making a fine appearance. —25. *Oct.*

Berwickshire Quarterly Report.

During the months of August and September, and until the fourth of the current month, the weather was uncommonly favourable for the growth and ripening of the crops, by which period those in the Merse, or lower tract of the county, were got into the stack-yard. Ever since we have had very changeable weather, yet in the intervals of dry weather, the Lammermuir farmers have in general completed their harvest; and it is with pleasure we add, that both in the Merse and Lammermuir, a more abundant crop of every description of grain has not been cut and stacked in as good condition for many years. The quality is also much superior to what it has been for several years. Turnips are an average crop; and as stock has been selling well, we do not expect there will be a deficiency. Potatoes are in general a plenteous crop. The prices of all kinds of grain have gradually declined since the latter end of July; being, at that period, Wheat 80s.; Barley 42s.; Oats 35s.; Peas and Beans about 68s. The prices of the first of the new crop in Berwick market—Wheat from 54s. to 58s; Barley 34s. to 40s.; Oats 23s. to 27s.; and on Saturday last, the 23d, the best price of Wheat was 55s.; Barley 35s.; Oats 26s. 6d. per boll of six Winchester bushels; but the market was rather dull. Draught Ewes have brought us pretty fair prices. Those of the Leicester breed from 40s. to 46s.; few of them are left in the county; but the sale of those of the Lammermuir breed has been rather dull of late. Cattle, as has been observed, have been selling well, and good draught horses still bring high prices. Butcher meat is, at present—Beef from 6d. to 8d.; Mutton from 6d. to 8d. per Dutch pound; and it is expected that they will maintain their prices for some time, as a great number of the Dinmonts are already sold, which are generally kept till the month of March and April.

Few farms in this county have been let of late; but those that have been let, have not brought such extravagant rents as has been given of late years, the farmers having taken the heavy burdens exigible from them a little more into their consideration in taking their farms.

It has been a pretty uniform practice in this county, for some years, and we presume in most counties both in Scotland and England, to let farms by sealed offers: one instance of the absurdity of this practice lately occurred.—A person wishing to take a farm advertised to

be let in this manner, sent his sealed offer of course; but after having done so, he entertained the idea that he had made an offer too low, and therefore made a second offer of about 15*s.* per acre more, while his first offer would have entitled him to a preference.—We would certainly recommend letting farms by public roup, which must be confessed to be a more clear and indeed equitable plan. Some proprietors in the county are adopting it; and there can be no doubt of the gentleman before alluded to being of the same opinion.

Almost all the fallow wheat is thrown into a favourable bed; and as most of the beans were got into the yard before the wet season set in, the lands whereon these were, are mostly sown with wheat; and the late rains have not had such a bad effect as was suspected.

A general meeting of the Tweedside Agricultural Society was held at Coldstream on the 11th of last month, which was attended by a great number of members from both sides of the Tweed. A very great number of Cows, Heifers, Sheep, Draught and Coach horses, were exhibited for the premiums; and several respectable and intelligent gentlemen having been selected to examine the stock, and adjudge the premiums, they awarded the Society's prizes accordingly to the extent of upwards of 80*l.* A variety of implements of husbandry, of a new construction, were also exhibited, some of which were much admired, and the ingenious inventors received premiums. A premium was also offered to a person for the longest term of service with one master, which a farm servant, named Peter Edgar, servant to Mr John Turnbull, farmer in Eyemouth received, being 3*l.* 3*s.* having served his master with integrity, skill, and activity for upwards of forty-five years.

This Society was instituted little more than two years ago, since which period it has been rapidly increasing in members, and from this and the great variety of stock exhibited, it is evident it has, and must be attended with the most salutary effects.——*Oct. 29th.*

Dumfries-shire Quarterly Report.

The important operations of harvest have in general been concluded for some weeks past; though, on some of the highest situations, stooks might be seen not many days ago. Upon the whole, this interesting and anxious season of the year may be classed as one most favourable. A fine tract of dry weather in the end of August gave excellent opportunity for cutting the earliest part of the corn, and though some showery weather afterwards set in, yet the rain was so moderate, that a single dry day always remedied the mischief, and made the stooks fit to be carried to the yard. The rick yards are well filled, and seldom has more produce been anticipated from the same bulk.—Wheat thrashed for seed, and some small quantities of Oats for mealing, certainly tend to confirm this cheerful prospect.—The Wheat crop may be stated as one of the best ever grown in this county, both as to quantity and quality. Not the least appearance of disease was observed; some smutted fields excepted, where the process of pickling had been neglected or despised.—All the fallows

sown with this grain, are already green, and its cultivation is annually extending.—The Potatoes are now taken up, and have yielded above an average.—The Turnip crop also is good.—The Corn markets are not yet opened, but no doubt a considerable reduction of price will take place. This, to a certain degree is necessary, the labouring and poorer classes having had great difficulties in supporting themselves for the last 18 months.—Lean Cattle gave good prices through the summer, and of late have given still higher.—The Butcher markets have also been better than ordinary.—The leases of the arable part of the Earl of Hopetoun's estate of Annandale, expire at Whitsunday 1814, and a new set took place in the beginning of this month. Much to the credit of his Lordship, and to the benefit of the estate, leases for 21 years were given. It is generally understood that the rents given, came up to the most sanguine expectations of the proprietor. The length of lease, with other encouragements given tenants will certainly in a few seasons make the most marked alteration in the agricultural state of that part of the country.—The Farming Society of Upper Annandale had their general meeting at Moffat on the 10th of September last, which was fully attended. In consequence of the premiums offered, capital stock of all kinds was exhibited, and the judges of the different sorts were a good deal puzzled in their determinations. From the respectability of the gentlemen at the head of this Society, and the eagerness shown by all classes of farmers to promote its object, much benefit may reasonably be looked for to that district of the county to which it is limited. It was stated to the meeting that the district contains 120,000 Scotch acres, the half whereof being sheep pastures, is improveable chiefly by stone enclosures, in which much progress has of late been made; that nearly 40,000 acres are now under the plough, of which the produce may be greatly increased by enclosure and regular rotation; and that 20,000 acres now in moor and natural coarse pasturage, are capable of producing grain and improved grasses by enclosure and cultivation, of which some highly productive specimens are already to be seen in the district. Such are the prospects of the result of the encouragement proper to be given by Landlords, by fair leases, accommodations, and rewards to industrious and active farmers.—27*th October.*

Fifeshire Quarterly Report.

THE expectation expressed in the last Report of a good and early harvest has in no respect been disappointed. The whole victual, with scarce any exception, is now secure in the barn-yards, without the smallest loss from the weather, which continued uncommonly propitious, and continues fine to this date. No more rain fell than was necessary for the springing of the new Wheat, of which a large quantity has been sown after fallow, which has come up thick and beautiful; also after potatoes, in the most favourable circumstances. The young Clovers are also thick and healthy. So far the prospect for the next crop is good.

As to the present one, from actual trial, the prospect is extremely flattering; the produce to the floor is good, and the quality of every species of grain, very superior to ordinary years; and certainly far above an average crop.

Potatoes have been got up and housed in excellent order, the quantity large and quality fine; and none have been lost by frost or rain, a circumstance very uncommon. Turnips are generally a fine crop; those very early sown suffered a little from the dry season, but none have failed; and of Straw and Hay there is abundance.

Upon the whole, hardly in any season, for many years, has there been so good a prospect of plenty for man and beast.

The prices of all sorts of Grain have begun to drop, but more moderately and slowly than might be expected. The prospect of distillation from Grain, has furnished a market for Barley. Were it not for this, that Grain would have been absolutely unsaleable; and a considerable reduction of price may assuredly be looked for, as the consumption of the distilleries will not be found equal to the quantity that will be soon brought to market.

And it scarcely can be doubted that the present crop will be found adequate to supply the consumption of the United Kingdom, without importing one particle of grain from any other part of the world. Let the farmer always enjoy a steady market, and the quantity of produce will annually increase, till plenty bring a reduction of price. Deprive him of this, and to a certainty the stimulus to exertion is destroyed; produce falls off; scarcity ensues; and immoderate high prices, not to be reduced by importation, are the infallible consequence.—*October 29th.*

Quarterly Report for Forfarshire.

The weather, during the last quarter, has been more dry and favourable, upon the whole, to rural occupations, than ever was remembered at this period. So much was this the case, that many springs were dried up; cattle suffered from want of water; and many mills were stopped;—so that the markets were for sometime scantily supplied; the pastures too were parched, and the growth of the Turnips was nearly at a stand. Of late we have had some inroads of frost, and favourable showers, which are snow upon the summits of the Grampians.

Excepting a few small patches, all the corn of any consequence in this county, was led and secured in the barn-yard before the end of the first week of October. The Wheat is a full crop in quantity, and of excellent quality; but in some particular cases, it has been found to exhibit a greater proportion of smutty ears than usual. Next to this, the barley may be classed in respect of quantity, and its quality uncommonly good. The Oats are somewhat deficient in quantity; but such as have been tried have been found to meal uncommonly well. The same observation may be applied to the Potatoes. Their quantity per acre is considerably under what is usually produced; though they were never known to be so farinaceous

and well flavoured. This may be owing to the great drought which prevailed while the roots were swelling. Upon the whole, it may be stated, that this county has been blessed with a very abundant land produce, which is well ripened, and of excellent quality.

The season has been uncommonly favourable for operations upon naked fallows, and for cleaning every species of drilled crop. The late sown wheats exhibit a very lively appearance; and since we were visited with occasional showers, notwithstanding inroads of frost, the Turnips have swelled into a very full produce. The cattle are already put upon them, as there is not such an aftermath of grass as usual.

Lean stock of every kind still support their former extravagant prices, though fat is rather on the decline. The price of Horses also still continues to rise. The retail prices are as follow: Oatmeal per peck, 1s. 10d.; Barley ditto, 1s. 4d.; Peas ditto, 1s. 4d.; Potatoes, 1s. 2d.; Beef, per lib. 7d. to 8d.; Mutton, 6d. to 7d.; Veal, 8d.; Butter, 1s. 6d. to 1s. 8d.; Eggs, per doz. 1s. 1d.; Quartern Loaf, fine, 1s. 1d.

Mr Don at Forfar, (whose unwearied Botanical researches, and assiduity in rendering this science subservient to Agriculture, need neither illustration nor eulogium), has this year tried another of the native Grasses of this county, in his nursery and botanic garden; though planted on arid steril sand, without manure, and the season was uncommonly dry, it yielded four abundant cuttings, and might still yield a fifth. It was highly relished by cattle.

Many farmers here were astonished when they heard it announced, that in place of the month of July, they would soon be making their Hay at Christmas; and in place of 150 or 200 stones per acre, they would not put up with less than 4 or 500 stones. That the Fiorin Grass would soon supplant Turnips and every other species of green food; and from its abounding in sugar, it would soon supersede the sugar-cane of the West Indies, if it did not even rival the beet roots which Bonaparte has been cramming down the throats of his vassals, under the name of sugar. It seems very probable, that the Fiorin Grass may be found a very valuable plant upon mossy soil, or in other situations that are particularly adapted for it. But while it is extolled, perhaps beyond its merits, there appears no reason for neglecting other Grasses and plants, which are natives of this country. It seems more adviseable to try experiments, with a view to ascertain the soils and treatment, by which such Grasses and plants may be rendered useful.—*Nov.* 1.

Letter from the Eastern District of Forfarshire, 29th October.

The favourable weather at the date of my last letter having continued, the harvest was very early:—it was begun about the 20th August; and by the 30th, it was general even in the most backward situations.—During the first ten days of September, some partial showers and dew in the morning retarded the harvest operations a good deal; and at this time, a strong easterly wind and rain laid over strong barley and oats, and broke down the late wheat then re-

maining uncut. The harvest was almost concluded during the succeeding good weather previous to the 4th current, when we had about eight days of continued rain. But this was followed by excellent blowing hard weather, which enabled the farmer to get in the remainder in the best condition, and likewise prevented any damage to what might have been put up in the stack before it was well win.

The crops of Wheat of every description, as well as Barley, have turned out beyond expectation, and seem to be of excellent quality. The Oats appear not to be above an average crop as to fodder, but are expected to yield plenty of grain, and to be particularly productive in meal, although the grain has not so full an appearance as we have seen: in several instances, there have been upwards of 19 pecks of meal from the boll of grain, (after taking from it the usual quantity for its manufacture.) The few Peas sown are a rich crop —where sown along with beans, the crop is bulky, and the pods of both well filled. The Potatoes are of most excellent quality;—in some fields, when planted on light dry lands, there is a deficiency; but the great quantity of land planted last season will make up a good crop in quantity. Owing to the arrival of a great deal of flax-seed from the Baltic in the spring, and its being to be had at a moderate price, a considerable quantity was sown beyond what was usual, which has succeeded well by what returns have as yet come from the mill. The Turnips, until the showers we had in September, looked but very indifferently; but since, they have had a most thriving appearance, although as yet the roots are rather deficient.

From the dryness of the soil in the end of August, little could be done to the sowing of Wheats with safety, until about the first and second weeks of September, when the fallow land was sown:—the whole was finished in the best manner, and now appears strong and well planted; and from the present appearance of fine settled weather, will be firmly established before winter. There has been little doing in the grain markets by the merchants, except for barley, which they bought up readily about the beginning of this month at 40s. to 42s.; but it has since fallen to from 38s. to 36s.; only there have been few sales at the latter prices. The small quantity of Wheat required for the consumpt of the neighbouring towns has been purchased by the bakers at from 38s. to 42s., that is, fair good samples; but inferior and blacked as low some of it as 30s.—No market for oats, except for mealing.—Meal continues to sell at 1s. 10d. per peck; and in quantities, for the supply of the town, may be sold at from 27s. 6d. to 28s.

Cattle markets have been looking up for these some weeks past; and at Kirriemuir, on Wednesday the 20th current, which is a considerable one, prices advanced not less than from 10 to 15 *per cent.* Good two-year old stots, for wintering, may be stated at an average of 13*l.*; Stots and Heifers for feeding, about 9s. to 9s. 6d. per stone. This is amongst the largest of the markets for the show of sheep, principally wedders; one or two lots (of the Hill kind) gave 30s. a head; but the prices in general were from 21s. to 27s.

Letter from Glasgow, 30th October.

For three months prior to this date, we have experienced an almost uninterrupted course of good weather, which has enabled the farmers in this neighbourhood to put down and secure their crops in the best possible order; and has caused the sowing of wheat, both on summer fallow and potatoe-lands, to be much earlier, and more easily performed, than is usually the case in this western district. If the common opinion holds true, that a favourable seed-time is generally followed by a good crop, we have reason to expect, that next year the wheat harvest will be uncommonly abundant.

Throughout the harvest, our markets have been abundantly supplied, particularly with Oats from Ireland, and a considerable quantity of Foreign and old British Wheat from the port of Leith. Barley was the only grain of which there was any scarcity; and our brewers having none on hand, were prevented for a considerable time from commencing their malting operations. But 2000 quarters of this grain have already been brought from England and the north of Scotland; and it is probable, that no want of it will now be felt during winter, either by brewers or distillers. It is now understood that the latter will commence on the 2d of December; and it will be of advantage to agriculture, if the Legislature refrain from putting a stop to distillation, until compelled so to do by the occurrence of some extreme scarcity.

As no less than 38,791 bolls Oats, and 8,811 qrs. Wheat, along with 1575 bags and 790 barrels Flour, and 4803 bolls Oatmeal, have been brought to this market during the last three months, there is, as might be expected, a considerable quantity of old grain on hand; which, together with the produce of last harvest, will in all probability render our market moderate throughout the winter.

Annexed, you have a statement of the present prices of all kinds of grain in this market. They are lower than they have been for some time past. It is probable, that owing to the abundance of grain at present in the country, they will gradually decline for two or three months to come, and then continue stationary during the spring months.

Wheat,	Dantzic,	48s. to 52s.
,,	Foreign, red,	45s. — 48s.
,,	British, old,	42s. — 50s.
,,	Ditto, new,	35s. — 46s.
Barley,	English,	44s. — 46s.
,,	Scotch,	40s. — 42s.
Oats,	British, old,	25s. — 30s.
,,	Ditto, new,	30s. — 34s.
,,	Irish, old,	24s. — 29s.
,,	Ditto, new,—none yet arrived.	
Beans and Peas,	old,	36s. to 40s.
,,	Ditto, new,	34s. — 38s.
Oatmeal,		29s. — 32s.

per boll of 240 lib.

Stirlingshire Measure.

per boll of 264 lib.

Stirlingshire Measure.

per 140 lib.

Inverness-shire Quarterly Report.

At the end of July, the weather set in dry, and has continued so ever since, with the exception of very few days. The long continued dry weather was very much against the Turnip crop, which, to all appearance will be a very light one. The harvest became general about the 23d of August; and a more favourable harvest has seldom been seen in this county. The crops of all kinds are excellent, and well secured, and may be reckoned fully better than an average. The Potatoes are a remarkably fine crop, and well secured, free from frost, although the hills are covered with a close mantle of snow, down to their very bases. The harvest in the Highlands will be nearly all finished if we get eight days more of favourable weather, in excellent condition, and good in quality, fully equal to an average crop.

There is great stagnation in the sale of all kinds of Grain. Some few sales that were made of the Barley in the first of harvest, were from 50s. to 55s. *per* boll; but, of late, there is neither price nor demand. The price of all kinds of Grain is looking downwards. Oatmeal from 2s. to 2s. 2d. p. peck of 9 lb.—no sales for Oats or Wheat. Potatoes, in the beginning of the season, were 24s. *per* boll of eight barley firlots, and last week they were so low as 12s. The price of Butcher-meat is on the decline, and selling at 4d. to 6d. *per* lib. of $17\frac{1}{7}$ oz. The summer fallows wrought excellently, and are, in general, well prepared. The Wheat seed is going on briskly, on potatoe ground; and if the present favourable weather continues, winter labour will be in a very forward state.

At the Great Beauly cattle market last week, there was an uncommon show of cattle, which were bought up at advanced prices, 20 *per cent.* beyond what could be obtained for them two weeks ago.

Upon the whole, there has seldom been a more favourable summer, a better harvest, and a finer conclusion for the farmer.

Oct. 27.

Kincardineshire Quarterly Report.

At the date of last Report, the weather was both favourable to vegetation and the various operations of husbandry; but being followed by almost five weeks of remarkably dry weather, soon occasioned a visible want of moisture in the nourishment of the Herbage and Turnip plants. It was not until about the 4th September that the Turnips began to make much progress; yet they will still be an average crop, and perhaps in some instances a little more. A disease has this year appeared in a good many instances among the Turnip, which, although not entirely a new one, corresponds exactly, both in appearance and effect, with that described by the Rev. Mr Findlater in the 13th Vol. Farmer's Magazine, called *Fingers and Toes*, here provincially termed *Knotting* or *Firing*. This distemper commenced so early as the beginning of August, and continued to affect the plants until about the beginning of September, when it was put a stop to by some copious rains. It was chiefly on

light gravelly soils that this disease occurred; and it is the opinion of a good many, that a deficiency of moisture was the principal cause of it. It is, however, very observable, that it owes its origin, in some measure, to the nature of the dung, being evidently more prevalent on the cotter's ridge, where short mixed dung was applied, than on that of his neighbour, which was manured from the produce of the straw-yard.

Grain crops, owing to such a continuation of dry weather, came as rapidly to the sickle as was expected; and a great part of the Wheat and Barley was got into the stook, and afterwards into the stack-yard, in the very best condition; and both these crops are of superior quality to those of some former years. Barley in particular is excellent; but this crop is not now grown to its former extent, having given way to that of Wheat and Potatoe Oats.

The rains that fell during the second week of September lodged, or rather broke down, a great part of the earliest Oats, in such a manner as to render the reaping of this part of the crop a most laborious operation. And, besides, a good deal of the best grain was stript off the straw before it was possible for the reapers to disentangle it upon the ground. But this, as well as the other species of crop, (with the exception of some of the late upland parts of the county, that stood the 'pelting of the pityless storm,' from the 3d to the 12th curt.), were stacked in fine order; and although it is not so bulky as last year, the deficiency, it is presumed, will only be felt in point of straw; there being every probability of its yielding much better in proportion both in grain and meal. Potatoes likewise are a fine crop, and unusually cheap.

Both meal, grain, and cattle markets, declined a little towards harvest; and except the latter, which have been more in demand of late, they are yet looking down. A few of the first samples of new Barley were bought up as high as 40s. and 42s. per boll, from an idea that distillation from grain would be permitted to commence in the beginning of November, in place of the 31st December, as stipulated by Act of Parliament; but this speculation was of short duration, and the farmer was, in a few days, compelled to accept of 10s less per boll, with a dull sale. Wheat 40s. and 42s.; Barley 32s. and 38s.; Oats, common, 23s. and 27s. per Angus boll; Oatmeal 1s. 9d. per peck.

Polled cattle are now in much esteem with the Mearns farmer: and some public spirited individuals have, with the most laudable intention, introduced a few of the Galloway breed, which will tend to bring this kind of cattle to still greater perfection. Field labour, as may be expected from the earliness of the season, is well advanced. Indeed, with some farmers, little remains to be done until the arrival of the lea ploughing season; but this is far from general. The young Wheats look uncommonly well.—28. *Oct.*

Quarterly Report for the Stewartry of Kirkcudbright.

At the date of my last (July 29.) the general appearance of the

country gave reason to expect a plentiful return from every species of crop. This expectation has now been completely realized. The warm and serene weather which prevailed throughout the whole of August, and the greatest part of September, brought on the harvest earlier than was expected; without, however, preventing the ears from being well filled, or diminishing the general produce. Springs and rivulets were dried up more than had been known for many years; vegetation, on pasture lands, seemed to have ceased; and the cattle, in many places, suffered from want of food: nevertheless, what is very remarkable, grain crops, even on dry and light soils, seemed to have suffered nothing, the ears being not only plump, but the straw as bulky as in seasons when moisture had been abundant. Potatoes and Turnips seemed at one period to have received material injury from the drought; but from the plentiful rains in September, both recovered, and may be stated at fair average crops.

Harvest commenced about the middle of August; became general by the first of September; and was nearly brought to a conclusion towards the end of the month. From its commencement to its conclusion, the weather was excellent; so that, unless from very bad management, grain of every kind must have been stored in the very best condition; and from the appearance of the barn-yards every where, a doubt cannot be entertained that the present must exceed an average crop. Barley may perhaps be stated as an exception; the quantity raised being comparatively small, and that, too, not on the best lands as formerly—these being now reserved for the cultivation of Wheat. The prospect of abundance, which is not peculiar to a few districts, but general over the kingdom, must be highly gratifying to every lover of his country, at a time when the sources of foreign supply are in a great measure obstructed; and, were our importation as practicable as formerly, it could not fail to be attended with serious inconvenience, from the additional drain of *specie* it would occasion, when from this and other causes it has been already so much exhausted. Great Britain, it is presumed, may for twelve months to come be considered as nearly independent of a foreign market for subsisting its inhabitants, and may probably even afford some supplies to its colonies and victorious armies, who have so nobly defended the cause of liberty on the Peninsula.

Grain is now reduced to its proper level; it would doubtless be a misfortune if it should fall much below it, as this could not fail to have the effect of diminishing the extent of tillage, discouraging the reclaiming of waste lands, and decreasing the demand for labour, which would bring greater evils on the lower orders than even the high price of bread.

The last quarter has been very favourable to the higher parts of the district, where want of moisture is seldom injurious. It is true, winter seems to have set in more early than usual; the mountains have been, some time ago, covered with snow, and we have seldom seen the frost so intense in the month of October; but this, by old

prognosticators, is considered not to augur unfavourably for the ensuing winter. Should it prove otherwise, the district is well prepared to encounter its severity. Fodder is abundant, and of superior quality; labour is in great forwardness. Wheat is mostly sown, and many fields in fine braird; and farmers are busy in preparing their fallows, for which the weather still continues highly favourable. Cattle markets are brisk, and prices of course rather on the advance. The markets are well supplied with butcher-meat, which has experienced a slight depression.

Prices of grain are merely nominal, as none has yet been bought for exportation. The following are as near the truth as can be ascertained. Wheat from 9s. to 9s. 6d. or 10s.; Barley from 6s. to 6s. 6d.; Potatoe Oats 3s. 6d. to 4s.; Common Oats 3s. to 3s. 6d.; Market price of Oatmeal 3s.; Beef from 6d. to 8d.; Mutton ditto. These, it seems probable, may continue to be the permanent prices during winter. Hogs are in abundance; and there never was so plentiful a supply of food for them.

Price of labour, or wages of servants, have undergone no material alteration since last year; but the demand for day labourers seems not to be so great as formerly.—30. *Oct.*

—*Lanarkshire Quarterly Report.*

The weather has not been often so good through the whole course of the harvest quarter as during the present year. Indeed, from the end of May till now, it has been to the farmer's wish. Occasional rains refreshed vegetation during the first 18 days of August; from that to the 3d September, the drought was uninterrupted, the sun seldom clouded, and the temperature high. Moderate showers, with two or three rainy days followed: but the weather through the last two weeks of September, was remarkably fine, and during October it has been, with the exception of a few days, such as any person could desire. The operations of the season were never less interrupted, and no part of the crop has been hurt by the weather. The harvest operations have seldom however lasted so long as they have done in this county during this season. They commenced in some parts of Lanarkshire during the first week of August, and they are scarcely yet ended. A good deal of corn remained to be cut during the last ten days; some is yet in the stook: and though the weather was uncommonly favourable for the maturation as well as harvesting of the crop, much of that which was latest in being cut, was still far from being ripe. The failure in some of the seed; the worming, and the bad weather in May, occasioned a great deficiency in the number of stems. The uncommon fine weather since the end of May replaced them; but they grew so numerous, and with such luxuriance, that many of the shoots were far from being ripe when cut.—The crop is not so bulky as it was last year: but the deficiency is more than compensated by the superior quality of all sorts of grain. The Oats in this county will yield in general, at least three, perhaps four pecks per boll more meal than they did last year. Of course the

meal, (as the corn has never been better secured), is much better in quality than usual.—Wheat was seldom seen to be so good in quality.—Peas and Beans are well podded, and the grain excellent.—Potatoes, except in some wet clay land where they were injured in May, and in very dry thin sharp soils, where they had not sufficient moisture during the months of August and September, (a thing that seldom ever happened before), are a most abundant crop. They were never found of better quality.—The price of Oatmeal, which had in this county remained steady at 2s. 2d. during the six preceding months, fell in September to 1s. 10d. per peck, at which it now stands. The opening of the distilleries will no doubt prevent the prices of grain from falling farther; and, as mechanics and labourers are now well employed, and their wages high, they are better able to pay that price, than they have been for some years past to pay the prices then current.—The produce of the Dairy has been abundant, and Cattle have never fattened better.—The growth of the Turnips was retarded by the drought in the end of August, but they have since made up their lee-way.—The young Wheat never had a better appearance, but much of it was sown too early.—*30th October.*

Letter from a Correspondent near Langholm.—28th Oct.

The Report for the last Quarter contains the most gratifying intelligence we have almost on any former occasion been enabled to communicate. A series of weather uniformly favourable and suitable to the season, has prevailed throughout the harvest months; and the crops are every where abundant, excepting only where the ravages of the grubworm on some moor grounds, during summer, had thinned the crop of Oats. We have had some occasional days of rain, but these were rather salutary, and no more than what the fields required. Both Oats and Barley are a plentiful crop, of the best quality, and well got. Potatoes are an abundant crop, and of the richest quality. Turnips, which have been subject to fewer failures this season than usual, display a full and weighty crop; and the young Clovers have generally a healthy and promising appearance. In short, the fine harvest weather, the abundant crop, and the excellent condition in which it has been stored, demand the grateful acknowledgments of every class of the community, and proclaim, in the most unequivocal language, 'How good the God of harvest is to all.'

Upon the store-farms the Sheep stocks are generally in good condition; and, though we have not so much grass on the pastures as we have frequently observed at this period of the season, yet we consider this as no unfavourable omen of their future welfare, as too great a flush of grass so late in the year, is reckoned by the experienced store-farmer as apt to generate diseases, at least not to contribute to the general health of the flock during winter. The prices of draft Ewes were a trifle lower than those of the preceding year. The country is now very generally cleared of wool, which met with a brisk demand this season, though a little lower in price. Black Cat-

tle have been in good demand through the season, and at present command good prices. The Grain markets have fallen very considerably. Oats are now selling at from 14s. to 16s. and Barley at 18s. *per* Carlisle bushel, equal to three Winchesters. Oatmeal is retailing at 3s. *per* stone. Butcher-meat is plentiful, and selling at a reasonable rate.

Though the Grain markets have fallen very much for some time past, yet this circumstance does not seem very much to influence the Corn farmer in the rents now given for land. A very considerable property in a neighbouring district of this county, has been recently let at a great advance of rent. Perhaps the term of a twenty-one years' lease contributed in no small degree to this advance. This is all fair;—when the tenant offers a handsome rent, the terms on the part of the landlord ought to be equally liberal.

East Lothian Quarterly Report.

Harvest commenced in a partial manner about the middle of August, and became general throughout the county before the end of that month; the weather was remarkably favourable from the beginning of that important season, till the first week of October, at which period nearly the whole Wheat, Potatoe Oats, and the early sown Barley, were secured in the stack yard in the finest condition; since then, however, the patience and industry of the farmer have been more sharply put to the test, as from the unsettled state of the atmosphere, the ingathering of the Peas and Beans, with the greater part of the later Oats and Barley, has been extremely tedious and harassing; as it is only within these few days that these, particularly the Beans, were got into a state of safety. As the stack yards are larger than usual, and as grain of every description yields well to the bulk, it is now ascertained that the crop is above an average of ordinary seasons, as was expected at the date of last report. The quality of the grain is likewise excellent; best qualities weighing, Wheat 65 lib., Oats 66 lib., and Barley 79 lib. per firlot of Linlithgow measure. Potatoes are also all saved, and found to be both abundant in quantity, and excellent in quality. A considerable extent of land is now annually appropriated to the growth of that crop; but as the demand for Potatoes is very limited in this district, they are frequently applied to the feeding of horses, and are considered, given even raw, as a profitable substitute for oats to a certain extent. During the winter horses are found to do their work well of one yoking a-day, with about 6½ lib. of Oats in the morning, and 18 lib. of Potatoes in the evening; and in the spring, when they perform two yokings a-day, they are allowed about 13 lib. of Oats, and 28 lib. of Potatoes in the twenty-four hours. Although 28 lib., or a peck of Potatoes, may be considered as a dear substitute for a feed of Oats, yet, when the much greater quantity of the former that can be raised upon an acre is taken into account, the difference of expense, even in that view of the matter, will not be found very material. But when it is stated, as has been repeatedly proved, that with the larger quantity of Potatoes, one third less of hay will fully supply a horse during the night, there can be no doubt but

that Potatoes, to a limited extent, are a cheap and safe food for draught horses.

Turnips have promised well throughout the season, and are now found to be a good crop almost every where. Fat Cattle and sheep having sold readily, and at high prices throughout the season, the lands in grass have afforded a fair profit to the farmer; which circumstance may tend to encourage the practice of having a greater proportion of the arable lands in pasture, the want of which has been considered by many, and perhaps with justice, as one of the greatest defects in the husbandry of the district.

As the summer fallows had been got into the best order in proper season, Wheat sowing commenced about the middle of September; and at present, almost every field originally intended for that crop, exhibits to the view a carpeting of the richest verdure. Many fields after Peas and Beans have also been got sown in fine condition; still however, several days of dry weather will be necessary to enable the extensive cultivators of Beans to finish that necessary business.

The Corn markets have been well supplied during the quarter; and the great reduction in the price of grain within the last six months, must afford the most lively satisfaction to the small annuitants, and the lower classes of society. To the farmer, however, with heavy taxes, and a dear rent to pay, the prospect of still declining markets, must create sensations of a very different nature. In Haddington, last Friday, the best prices were for Wheat, new, 46*s.* 6*d.*; Barley 38*s.*; Oats 26*s.*; and Beans 31*s.* per boll. Oats and Barley have both declined considerably of late; but as the distillers will soon begin to work from grain, it is probable they will not be much lower; although both Wheat and Beans are expected by some to be still more depressed.——*Nov. 4th.*

P. S. Haddington Hallowmas fair was held this day, when a very considerable number of excellent Cattle were brought forward for sale, and almost the whole were readily bought up at very high prices; indeed *one* parcel formed the only exception, but which might also have been disposed of, had the owner been inclined to accommodate himself to the present prices. Now that a fair trial has been given to that new market, it is but reasonable to expect, from this day's success, that in future the Haddington Hallowmas fair will be one of the best in this part of the kingdom; for it is certainly agreeable to the nature of commerce, for an uniform and extensive demand to create a corresponding supply. Cattle dealers and drovers, in other parts of the kingdom, may therefore, in future, bring forward their stock, in full confidence of finding a ready market.——*Nov. 5th.*

Mid-Lothian Quarterly Report.

In the Report of the 2d of August last, auspicious hopes were given of the prospect of plenty; and the harvest, now happily concluded, even in the highest situations, has fully realized them. A better season for every agricultural purpose has occurred seldom; and, with the exceptions then noticed, every thing has been matured and well got.

The crop, upon the whole, is above an average; and in certain

situations, Wheat, in particular, is little short of the two preceding crops put together, and the quality is good.

The potatoe crop has been also safely got up; and, although not remarkably abundant, yet, from the more than common extent planted, they will prove a plentiful article.

Wheat, upon the summer-fallow fields, was sown early, and that after green crops is now nearly completed, a circumstance that has seldom occurred at so early a period of the season.

While there is every appearance of plenty for mankind, the keep for stock is no ways deficient. Turnips, upon the whole, are good, although not large, owing to a want of moisture during the month of September, which has rarely hitherto occurred in this county.

The offals of distillation from Grain, together with the surplus potatoes, for which there will be little demand in the usual way, afford a prospect that the butcher market will be well supplied throughout the season.

Three years since, Live Stock were scarce and unprecedentedly high; since then, breeding has gone on in more than an ordinary ratio, and it was hoped winter stock would be obtained upon more moderate terms; but, contrary to expectation, they were considerably higher than last year at the great October Falkirk market, both for Cattle and Sheep, which affords but an indifferent prospect to the feeder.

A survey has lately been made from Lock, No. 16. of the Great Canal, for a branch to pass a little above Falkirk, requiring several locks that length; but from that to Edinburgh to be upon a level, and, of course, to require no locks. The distance between Falkirk and Edinburgh, by the post-road, is 24 miles; and by the track of the proposed Canal, is no more than about 27 miles. When the country through which it has to pass is considered, the idea is magnificent.

It is proposed to be 35 feet wide, and five feet deep:—There unavoidably must be a great deal of cutting and upfilling, which must add greatly to the expense. But why so great a width?—An error of this kind at the outset may deter subscribers, and prevent the undertaking by the immensity of its expense.——*Nov.* 1.

West Lothian Quarterly Report.

The late harvest, as to weather, may be reckoned one of the best in the memory of man:—no shaking winds, nor rotting rains—the crops of every kind safely stacked, excepting in some upland parts. The low districts have been all cut, and led safely in during the months of August and September.

Taking the whole crop together, I think it a full average one; although the Oats on cold thin land is found not so full a crop as could be wished. The Barley also, on lands that had a damp tendency, was hurt by the rains in May; Potatoes have lifted well, and are all safely housed or pitted—they turn out, both as to quantity and quality, good. Turnips are looking well, although not so large in size as in some years; they are firm and solid, and will feed well.

The second crop of Clovers has been unusually luxuriant, owing to the dry favourable weather: they have only begun to fail for these two days past, by the hoar-frost that we had upon the 16th and 17th of this month. All the fodder will be found sound and good for the winter cattle, excepting some of the Wheat fields, which in certain parts have been attacked with the rust on the straw, which spoiled both the quality of the grain and straw. Fortunately for individuals, and the country at large, the most part of the Wheat crop was in a state of such forwardness at the time the weather caused this disease, that few fields comparatively have suffered.

We see Government have very wisely permitted distillation from grain in the month of December, as there are no fears of a deficiency of food this year. This will have the happy effect, in a great measure, to prevent illicit distillation, which has been so much resorted to in the absence of the legal manufacture.

The prices of grain at present are as follows.—Wheat 40s. to 45s.; Oats 18s. to 26s.; Barley 40s. to 42s.; Oatmeal 19d. to 21d. per peck of 8 Dutch lib.; Butcher meat, sinking offals, 10s. 6d. to 11s. per stone of 17½ ounces to the lib. 16 lib. to the stone; market-price, 6d. to 8d. per lib.

The demand for wintering stock has been considerable at the late great Falkirk Tryst; the prices rather upon the advance.—*Oct.* 19.

Morayshire Quarterly Report.

The harvest was all over some weeks ago, and the crop secured in infinitely better order, and with less expense and trouble than it has been for several years back. The stack-yards have a very respectable appearance; and as the crop suffered nothing either from wind or rain, it may be expected to give well for the bulk. A large proportion of the Wheat is of very excellent quality; but partial injury has been sustained from mildew, which appears neither to have been confined to the latest nor the lowest situations. Some fields have suffered so much, as scarcely to be worth thrashing; very little, however, is quite so bad, although a great quantity was injured in different degrees, according to the state of forwardness the Wheats were in when it came upon them. Wheat, notwithstanding, may be considered more than an average crop. The breadth of Barley sown in this county last season, was greater than it has been for some years past, and although a great many fields were hurt by too much rain when they were brairding, yet the weather towards harvest being very favourable, they mended more than could have been expected at the date of last Report, and Barley may be noted fully an average crop. Oats too are rather above than below an average, and the quality of both is very good. Peas and Beans are rich in grain, and were got well harvested; but the bulk of them, when gathered together, is less in proportion than that of any of the other species of grain. The early sown Wheat has a strong fresh braird, and a considerable quantity has been laid down in very good order during t'

last two weeks. Turnips have mended greatly of late, and are, upon the whole, a very fair crop; so are Potatoes, which have been taken up in the best condition possible. Prices of Cattle have rather advanced of late; but very few will be sent out of the county after this season of the year, till the months of March and April. Oatmeal sells in Elgin at 2s. per peck of 9 lib., and Butcher meat at 6d. to 8d. per lib. of 17½ oz.—*28th October.*

Perthshire Quarterly Report.

Never perhaps did an autumn realize, more completely than the present has done, the sanguine hopes excited by a mild spring and a favourable summer. As early as the month of April, the crops promised to be not only more abundant, but also sooner ripened than usual; and through the whole of the succeeding months, with the exception of a week or two about the end of June, when the want of rain began to be a little felt, they continued to present the same appearance. They suffered nothing from fogs, rain or frost, so common and so pernicious in this variable climate, and were all secured in good order, at least a fortnight earlier than usual. The following is an abstract of the weather for the last three months.

	Number of Fair Days.	Number of Rainy Days.	Quantity of Rain.	Mean Temp. of Max. & Min.	Mean Temp. of Ten & Ten
August	—	—	0.478	———	———
September	19	11	2.287	54.047	53.959
October	21	9	2.052	44.102	43.504
			4.817		

The first time during the season, that the thermometer (situated 4 feet above the surface of the ground) fell so low as the freezing point, was on the night between the 14th and 15th October, when it stood at 30°. During the month of September, it ranged between 66° and 32°. This mildness of the harvest months has been particularly favourable to the Potatoe crop, which is still perhaps below an average in quantity, but of excellent quality. Turnips too have mended very much, and will greatly exceed what was at one time expected. Fallow Wheats were laid down early, and in excellent condition. The weather too has hitherto been, and still continues to be favourable for sowing Wheat after Potatoes. The frost, however, threatens now to be very severe. During last night the thermometer has been as low as 24°.

The markets for some time past have been rather on the decline; whether they will continue to fall without any foreign supplies, is very doubtful. *Relatively*, the crop is certainly plentiful, but *absolutely*, it may be deficient. There is reason to fear that Britain has not yet ceased to be an *importing* country. The following are the present prices in this district:—Wheat, 36s. to 40s.; Barley, 30s. to 34s.; Potatoe Oats, 22s. to 25s.; Common do, 20s. to 22s.; Oatmeal, 1s. 8d. per peck. Grass parks have paid well. Cattle were perhaps never higher than they are at present; a proof that there is

no great deficiency either in fodder or turnips, unless some may have been induced to keep on a greater winter stock than they ought to do, from the straw-yard having paid so well the two last years.

It may not perhaps be deemed foreign to the subject of an Agricultural Report, to mention, that at the Michaelmas Meeting, held at Perth on the 5th instant, resolutions were passed in favour of discontinuing the prohibition of distillation from grain. Every legal step that the landed proprietors of the country take for promoting the interest of the farmer, claims his grateful acknowledgment. It is only to be regretted, that they do not afford more opportunities of doing so, even where their own interest is deeply concerned. The Property tax, as hitherto levied, still remains a grievous burden on the tenantry; and from the apathy with which landlords view it, becomes every day more and more a disgrace to them. It is neither by the exertions of an individual, nor the resolutions of a county meeting in a newspaper, nor a few petitions presented to the Legislature at intervals of months or years, that an evil of this magnitude is to be removed. If redress is ever to be obtained, it must be by the combined efforts of the Agricultural Body—and surely the firm and united voice of such a Body, could not, even in *these* times, be long disregarded.—*29th October.*

Tweeddale Quarterly Report.

The weather, during the last quarter, has been very favourable for bringing to maturity and harvesting the crop. Harvest commenced in this county about the beginning of September, and became general about the 8th. The weather through the whole of that month continued fine; yet, notwithstanding the fine weather, a number of fields did not ripen equally, and many patches were seen standing unripe when the rest of the field was cleared, especially on spungy ground, from being too much drenched with rain in the end of April and beginning of May;—of course the harvest was very tedious. The month of October, though often rainy, yet as no great quantity fell at any one time, so as to drench the stooks, the crop is now all secured in good condition.

Wheat, though on many fields thin on the ground, was particularly well eared, and may be reckoned an average crop. Oats rather above an average. Barley about an average. Peas considerably above an average, but not extensive. Potatoes both bulky and good in quality, and considerably more extensive than usual. Turnips are generally a good crop, except on some fields that were too wet in the month of May for being properly prepared. Though the season has been good for sowing Wheat, yet no great extent of it has been sown;—what was sown in the month of September is looking very well. Young Clovers are looking well. Stock of all kinds is good; and there is a brisk demand for both Sheep and Cattle, at good prices, for feeding on turnips. We have had almost no Meal in the market at Peebles, through the summer and harvest: the retailers were generally supplied by farmers and dealers in the neighbourhood, and the prices regulated by the Dalkeith market.——*Oct.* 30.

Ross-shire Quarterly Report.

To furnish a correct report of the preceding harvest, including the period of filling and ripening, calls upon us for a detail of weather singularly favourable for that, above all, important period of the season. With little exception, the month of August was dry, accompanied with serene sunshine and gentle breezes, which gradually matured the Corn for the sickle. The last few days of that month, and the first week of September, it sunk almost into a profound calm, allowing shearing, which had generally commenced about the beginning of September, to proceed in a satisfactory manner, but only advancing slowly the condition of the Corn for the stack; and, owing to showers, and the softness of the weather, little could be done in the carrying process till about the 20th. As a very great part of the crop had been cut down previous to this, and much of it dead ripe, the stacking proceeded with great rapidity; and being then favoured with a succession of two weeks of the finest weather that could be wished, the bulk of the crop was brought home in capital state. The weather broke on the 4th of this month, and has continued variable; and as there has been occasionally smart frosts since then, the Beans and Potatoes which have been in hands during this period, cannot have altogether escaped injury, although it is supposed to be but of trifling extent. Indeed it is a very rare thing that a crop enjoys such excellent weather in bringing it to perfection, and being secured with so little loss as has been the case with this one. We venture to anticipate, that many will be agreeably deceived by finding it thrash out beyond their expectations: this idea has been, so far, confirmed by trials already made. Wheat, in particular, will be found uncommonly abundant: ten bolls per acre, and the quality weighing 64 to 65 lib. per firlot, will not be uncommon. Barley and Oats which did not yield great bulk, are also of excellent quality. Beans are remarkably well podded; and except where they were not fully ripe before being visited with frost, will also be of fine quality. Potatoes are an abundant crop, and have been saved with scarcely any loss. Turnips have also attained full growth, and are more than ordinarily a weighty crop.—Some sales of Barley have been made wholesale at 48s. and in retail at 50s. per boll. In both ways 2 or 3 months credit is commonly given. The wholesale merchants in general are what are termed good men, but the retail ones at best are hazardous. Some sales of Oatmeal have also been made at about 36s. per 9 Dutch stones. This, as well as the Barley, is confined to the use of the county. The sending of Corn to the south last year having been an unprofitable trade, will, in all probability, cause that market be later of opening this year than usual. A considerable proportion of the fallows were sown with Wheat in the best order in September; so that seedtime is now far advanced after the different green crops, and all in excellent condition, the ground having never yet been drenched with rain. Cattle Markets kept very dull, and at reduced prices, till after the Falkirk October tryst, when there has been a

brisk demand at good prices, say from 9s. to 10s. per Dutch stone, sink.

It is with much regret we observe so little done in improving the district roads; but to the expressing of regret we must confine ourselves: for although the occupiers of land pay all, yet the Farmers have no voice either in appropriating, or disposing of the funds.—Those who have entered on leases, cannot help themselves; but those who have new bargains to make in this county will be differently situated. The matter is before their eyes; and as a certain sum can only be paid by farmers from the lands, it is of no consequence to whom they pay it. It will only cost them the trouble, after deducting ordinary charges, to ascertain what they have to pay for Property Tax, and the illiberal assessment for roads: after these, the proprietor will be entitled to the balance.—*30th October.*

Roxburghshire Quarterly Report.

From the extreme pressure the consumer has experienced these two years past from the high price of Grain, we feel particular satisfaction in being enabled to state, that the result of the last harvest has been equal, in all respects, to what the most sanguine expectation could have anticipated. From the beginning of June, the summer was one continued series of the most mild and genial weather that has occurred for many years; consequently a great proportion of the crop, and that the most valuable part of it, was ripe nearly three weeks earlier than last year, and secured in the barn-yard in the month of September, in the most perfect state: Indeed nothing but patience was required to effect this object to the farmer's entire satisfaction. To bring corn into the barn-yard with the risk of being heated, we consider the very extreme of folly in such a season. The loss there is certain; whereas the risk of allowing it to remain in the field until it is in a proper state, is very small, and only eventual. The winter Wheat has proved, as we predicted, a most abundant crop, and universally of the very first quality. The spring Wheat, although not so bulky, is likewise excellent grain; but we hope the farmer will not be induced, from this casual circumstance, to persist in sowing spring Wheat so extensively as it has hitherto been done in this district. The injury to the soil is certain, and the risk great, from the frequent recurrence of adverse seasons. We would recommend, and much prefer, upon Turnip soils, sowing a proportion of the grass-land with winter Wheat, by giving it two or three furrows, generally denominated Rag Fallow: in this way the Grain is completely covered from the influence of the frost, and the soil much benefited by the sod being completely reduced. Very great crops have been produced from this system for some time past; but, at the same time, we entirely disapprove of sowing Wheat after Grass, with only one furrow, as it generally leaves the land in bad order; and the crop is often materially injured, by the seed not being sufficiently well covered, and thrown out during the winter and spring months by the influence of the frost.

Barley and Oats are considered fully an average crop, although the latter are, in some instances, rather thin upon the ground; but they yield remarkably well to the bulk, and also in meal.

Peas are much above an average crop, and, in general, secured in the best order.

Potatoes are fully an average crop, and of excellent quality; those that were not early taken out of the ground, have experienced several nights of pretty severe frost; but we hope they are not materially injured by it.

As a natural consequence of these fortunate results, the markets for Grain have experienced a very considerable reduction. Wheat is selling at 55s. per boll of 6 Winchester bushels; Barley at 32s.; and Oats at 24s.

Turnips may be stated at fully an average crop in this district, although they suffered considerably from the want of rain; and a very considerable alarm was excited at one time, from the disease of fingers and toes having made its appearance more or less throughout the district. Some fields have suffered very severely; but the loss is by no means so great as was at first apprehended.

The demand for winter Stock to put upon turnips, has been fully equal to last year; in particular, Wedder Sheep have been much wanted, and sold nearly 10 per cent. higher than last year.——*Nov. 1.*

Wigtonshire Quarterly Report.

The long continued drought appeared at length to depress the demand and prices of live stock in a considerable degree; but there has been no serious or alarming fall. Partial rains, and the lengthening nights have done much to relieve the country, by renovating the decayed herbage, and covering the thirsty fields with the pleasing verdure of Michaelmas spring.

Harvest has been propitious almost beyond precedent; and although a little shake was partially experienced, yet an abundant produce has been safely lodged in the barn-yard. If there be any considerable exception to this description, it must have been occasioned by removing the crop too hastily from the field, for which the recollection of critical seasons may sometimes admit an apology.

Little thrashing is yet done in this district; and as the grain market appears still on the decline, it is not very likely that many considerable sales will be effected for some time.

For storing the Potatoe crop the weather continues very fine; but in some situations this excellent article of produce is less abundant than usual, owing to the great want of rain in July and August.

A large extent of Wheat is already sown under the most promising circumstances, and the cultivation of this grain is still on the increase.—How far this increased cultivation is to prove ultimately judicious, the experience of a few years must determine; and from that surest of all tests, rules will be derived, whereby to regulate future practice and opinion. It was long affirmed that the atmosphere of Galloway did not admit enough of sunshine for wheat; at other

times it has been said that the soil was too weak. In later times, men of solid judgment considered the imperfect agriculture of the district as being the chief obstacle; and as this is confessedly improving very rapidly, it is highly probable that all prejudices on the subject will soon subside.——*Oct. 29th.*

ENGLAND.

Letter from a Correspondent in the South of Devonshire.

'Our Wheat harvest commenced generally about the 14th of August in the lower parts of this county, though we had some corn cut about seven days earlier; the Barley was not a week behind the Wheat; the crops, in general, are very good, and the weather was so very favourable that many old people don't remember so fine a harvest. The Barley that has been thrashed out proves a good sample as well as the Wheat; the prices are on the decline—Wheat at 12*s.* to 13*s.*; Barley at 6*s.* per bushel. Of Oats there are none at market yet; indeed with so abundant a crop it cannot reasonably be expected that corn should still retain the high price of last year. But though the fine dry weather was favourable for getting in the corn well, yet it has completely burnt up the grass, so that the whole country has had a most barren appearance until the late rains, except the watered meadows, for which this county is famous. Turnips will be a better crop than once was expected; but they are not cultivated with so much care, nor the land so well worked as in the north of England; they are generally taken before a crop of Wheat, and pulled and eaten off early, and the Wheat sown by Christmas. There is no Wheat sown yet; it is more early than is usual here; and the late rainy weather which we have had for the last fourteen days has prevented it, as the land is now completely soaked.

Both Lean and Fat Cattle still retain their high price; indeed we can hardly expect, in this county, but that Fat Cattle should be rather higher than in others, from the great demand for government contracts, which are nearly 400 fat bullocks per week for the Victualling Office, for the Royal Navy, the Prison Ships, and Garrisons in Plymouth, and the War Prison on Dartmoor.'——*Oct. 18.*

Letter from the Neighbourhood of Lancaster.—Nov. 2.

'The farmer never witnessed a more favourable season than we have had these few weeks past; all kinds of work have gone on rapidly. Wheat sowing in all the forward districts is nearly completed, and many fields of Wheat exhibit a beautiful green appearance. Many farmers have got their Potatoes (which constitute a considerable part of the farming of Lancashire) stored in fine condition, and the land sown with Wheat; but several were interrupted by a change on the 23*d.*, since which they have not been able to do any thing from excessive rain. The commencement of harvest was remarkably favourable, and most of the Wheat got secured in the finest possible condition; but in the month of September, the weather was changeable, rendering it difficult to get in the grain; after which we had re-

markably fine dry weather, and at last got all well secured, without suffering much damage. The crops of Wheat and Oats are generally good, and supposed to be equal to an average. Beans are better than have been known for several years. Potatoes are a very heavy crop, and, from the large quantity planted, are expected to be very cheap; from this expectation, they are going off rapidly for Horses, Pigs, and Cattle, as they are considered, at present prices, cheaper food than any other. They sell now at from 1s. 4d. to 1s. 6d. per bushel of 75 lib. Lean cattle continue to sell at high prices. Sheep are not much kept in this country, the dairy occupying more of the farmer's attention; but there is more of a disposition for sheep than formerly, several in this neighbourhood having lately got a few of the Leicesters, and we hope to see them gain ground. The present price of the Wool is encouraging, so far as it goes; it is selling now at from 14d. to 16d. per lib. Markets as under. viz. Wheat 13s. 6d.; Oats (Potatoe) 5s. 3d.; Barley, 6s. to 7s.; Beans, 7s. 6d. per Winchester bushel. Oatmeal 30s. per load of 240 lib. Beef, 7½d.; Mutton, 7½d.; Veal, 6d. to 7d. per lib. best pieces. Cheese 75s. per cwt. Butter, 1s. 4d. per lib. of 18 ounces.

Letter from Liverpool, 27th Oct.

Since we last had the pleasure of addressing you, our corn-markets have been gradually declining for almost every article; and most kinds of old grain are become quite unsaleable, excepting fine old Oats for horse provender, and old foreign Wheats for mixing with new soft—owing in a great measure to the very fine state in which new grain in general comes to market. We believe the late harvest has been singularly good; and the whole, with very few exceptions, has been got secured in the best possible condition; and the crops are most abundant, and of fine quality, throughout the three kingdoms.

The quantities of Foreign Corn imported into this country since January last, have been very great—say nearly 300,000 quarters of Wheat into the port of London, besides considerable quantities of Rye, Oats, and some Barley. This, together with what has come here, and into other ports, is no small quantity; and as the greater part of it has lately been imported, of course a great proportion of it must remain unconsumed. To this may be added the remaining old stocks, the produce of this country and Ireland; and although difficult to ascertain with any degree of accuracy, still it must not be considered trifling, particularly at the commencement of a crop, which we believe unprecedented for both quantity and quality; and notwithstanding general distillation will be allowed from grain after December, it cannot however be considered otherwise than a fair presumption, that the prices of all kinds will continue throughout the season moderately low.

We have not had any new Scotch grain; but have been given to understand the quality is very good. Have had, however, several cargoes of both Wheat and Oats from Ireland, of very fair quality.

The produce also of this part of the country, which has been brought here and to the neighbouring markets, appears to be of excellent quality, and very abundant.—We are therefore inclined to be of opinion, that our importations this season will not be so great as of late years; because those parts of the interior that required supplies from this town, are beginning to meet us at Manchester, and other great manufacturing towns, with Flour, Oatmeal, &c. of their own growth; and therefore they would appear to have a sufficiency and to spare; which plainly shews the greatness of the present year's crops, and accounts very satisfactorily for the trifling demand we have at present into the country. With reference to our Importation List, and Current Prices, we are, &c.

Current Prices of Yesterday's Market.

Wheat	English, Welsh, new	13s. 6d. – 13s. 9d. – 14s. 0d.		
„	Scotch, new	12s. 10d. – 13s. 3d. – 13s. 6d.		
„	old,	10s. 6d. – 11s. 0d. – 12s. 3d.		
„	Irish, new	12s. 9d. – 13s. 0d. – 13s. 3d.		per 70 lbs.
„	old	10s. 0d. – 11s. 0d. – 12s. 0d.		
„	Foreign	13s. 0d. – 13s. 6d. – 14s. 3d.		
Flour,	English, fine	64s. 0d. – 66s. 0d. – 68s. 0d.		
„	2d	56s. 0d. – 58s. 0d. – 60s. 0d.		
„	Irish, fine	60s. 0d. – 62s. 0d. – 64s. 0d.		p. 240 lib.
„	2d	52s. 0d. – 54s. 0d. – 56s. 0d.		
Barley,	English, new	7s. 4d. – 7s. 6d. – 7s. 9d.		p. 60 lib.
„	Scotch do.	7s. 0d. – 7s. 3d. – 7s. 6d.		
Beans,	English old	64s. 0d. – 68s. 0d. – 70s. 0d.		
„	Scotch & Irish, old	58s. 0d. – 60s. 0d. – 62s. 0d.		per Quart.
Oats,	English Potatoe, new	5s. 0d. – 5s. 2d. – 5s. 4d.		
„	Scotch do. do.	4s. 10d. – 5s. 0d. – 5s. 2d.		
„	old	4s. 3d. – 4s. 6d. – 4s. 9d.		per 45 lib.
„	Irish new	4s. 9d. – 5s. 0d. – 5s. 2d.		
„	Ditto old	3s. 9d. – 4s. 0d. – 4s. 6d.		
Oatmeal	English new	44s. 0d. – 46s. 0d. – 48s. 0d.		
„	do. old	42s. 0d. – 44s. 0d. – 46s. 0d.		p. 240 lib.
„	Scotch do.	38s. 0d. – 40s. 0d. – 42s. 0d.		
„	Irish do.	34s. 0d. – 36s. 0d. – 38s. 0d.		
Malt,	English	13s. 0d. – 13s. 6d. – 14s. 0d.		p. 36 quarts.

N. B.—The first new Scotch grain arrived yesterday; and a little has been sold at the prices above noted.

Importations of GRAIN, &c. into the Port of Liverpool, From 29th July 1813, till 27th Oct. 1813 inclusive.

Date	Description.	Wheat. Qrs.	Barley. Do.	Oats. Do.	Malt. Do.	Beans. Do.	Peas. Do.	Rye. Do.	Shelled Barley. 112 lb.	Flour. 240 lb.	Oatmeal. 240 lb.
1813.											
Aug.	Coastwise	2,137	61	2,200	1,830	825	—	—	40	890	—
	Irish	9,582	602	41,408	—	42	—	63	—	983	962
	Foreign	—	—	—	—	—	—	—	—	5,705	—
Sept.	Coastwise	566	55	397	2,307	523	—	—	192	628	174
	Irish	4,196	93	12,830	—	805	—	20	—	2,751	1,400
	Foreign	2,450	—	—	—	—	—	—	—	—	—
Oct.	Coastwise	566	78	620	3,582	588	—	—	96	2,428	1,953
	Irish	4,754	4,406	15,060	—	16	—	24	—	1,802	2,929
	Foreign	5,687	62	—	—	—	—	1,362	—	—	—
	Total	30,538	5,357	72,520	7,719	2,799	—	1,469	328	34,297	8,299

Letter from London, 5th November 1813.

Imported into London from 28th June to 25th Sept. inclusive.

	Wheat.	Barley.	Malt.	Oats.	Rye.	Beans.	Peas.	Linseed.	Oil-cake seed.	Rape-seed.	Tares.
	QRS.	QRS.	QRS.	QRS.	QRS.	QRS.	QRS.	QRS.	QRS.	QRS.	QRS.
English	26,300	9613	24,800	101,344	857	14,102	109	483	9018	576	575
Irish...	1,625	—	—	33,165	—	40	—	986	—	—	—
Foreign	93,769	1020	—	16,920	2123	500	9077	12,020	—	7497	—

English Flour 76,572 sacks.——Irish 300 sacks.

Imported into London from 27th Sept. to 30th. Oct. 1813 inclusive.

	Wheat.	Barley.	Malt.	Oats.	Rye.	Beans.	Peas.	Linseed.	Oil-cake seed.	Rape-seed.	Tares.
	QRS.	QRS.	QRS.	QRS.	QRS.	QRS.	QRS.	QRS.	QRS.	QRS.	QRS.
English	29,991	32,983	14,810	52,932	157	10,354	4678	158	114	366	645
Irish...	11	—	—	2,590	—	—	—	285	—	10	—
Foreign	24,715	699	—	3,550	4800	152	647	16,946	—	2885	—

English Flour 54,333 sacks.——Irish none.

Ever since the middle of August, every kind of grain has gradually declined in value in this, as well as in every other market in England, Scotland, and Ireland, with the exception of Barley, which experienced a considerable advance in price towards the latter end of September, from the circumstance of distillation from grain having been permitted in Ireland, and a report of the same license being about to be extended to England and Scotland. The article, however, has again declined to its former value.

The original cause of this general decline in price, and consequent dullness in the corn trade, may, in the first place, easily be traced to the flattering appearance of the crops of grain in all the three kingdoms, then mostly in the field; and now that these prospects have been so happily realized, by the ingathering of an almost unprecedentedly bountiful crop, and that in general good condition in every part of the kingdom, it is to be considered as a natural consequence that prices of grain do still continue to decline. To the stock of British corn well secured, we must also add a regular, and rather liberal, importation of foreign grain; and, from the now very favourable state of our foreign relations, there is no doubt but we shall continue to receive considerable foreign supplies during the season.

The export of corn has been, for some time back, very trifling; and although there has been limited purchases of Wheat made within these few days in this market for that purpose, still it is not to such an extent as to affect prices materially. Taking all these circumstances into consideration, we certainly think it probable that prices may continue to go a little lower for some months to come; unless the Legislature take some step to protect the agricultural interest of the country, which will certainly be in danger without such aid.

Prefixed is a list of importations of grain and flour into the port of London for one quarter, ending 25th September; and also from the latter date up to the 30th ult. You have also a note of the value of different kinds of grain and seed in this market on Monday last, the 1st instant.

Since the 30th ult. there has been a farther arrival of foreign Wheat, say from 12,000 to 15,000 quarters, but it is mostly of inferior quality, and a good deal out of condition.

Essex and Kentish Wheat	75s. to 80s. and 90s.
Suffolk, Norfolk, and Lincolnshire,	70s. — 80s.
Scotch, and northern counties	75s. — 84s.
Irish	68s. — 75s.
Dantzic and Elbing	75s. — 84s. 90s. to 95s.
Pomeranian, Hamburgh, and Danish,	70s. — 75s. and 80s.
Courland—for export	60s. — 68s. — 75s.
Crushing Linseed	100s. — 110s.
Rye	52s. — 56s.
Barley	50s. — 54s.
Malt	88s. — 95s.
English feed Oats	25s. — 30s.
Ditto Poland	35s. — 36s.
Scotch and Berwick feed	30s. — 35s.
Ditto Potatoe	38s. — 40s.
Irish feed	30s. — 32s.
Ditto Potatoe	34s. — 36s.
Beans	50s. — 55s. old 65s.
Boiling Peas	84s. — 90s.
Hogs	56s. — 60s.
English Flour	75s. — 80s. per sack.
Foreign Rape-seed 46*l.* per last of 10 quarters.	
English ditto 48*l.* ditto	ditto.

Northumberland Quarterly Report.

During the months of August and September, we had very little rain. The long continuance of fine warm dry weather was exceedingly favourable for ripening and harvesting the corn crops; the greatest part of which was got in before the wet weather commenced, on the 4th of October, which continued, with little intermission, until the end of the month, and has occasioned several parcels of

Beans to be yet in the fields, both in Northumberland and the county of Durham, as well as some Oats in the western parts of those counties; and has also occasioned a large portion of the summer-fallows for Wheat to remain yet unsown.

The Wheat crop is the best we have had for several years, being in general free from any disease, and the ears so complete as scarcely to have a defective grain. The whole is so well perfected by the warm dry weather, as to be uncommonly productive; and there is no doubt that the crop is considerably above an average.

Barley and Oats, upon dry lands, are an average crop; but upon clayey and wet soils they are below it.

Peas and Beans are in general good; but the latter much injured by the long continuance of wet.

Turnips and Ruta Baga were, by the long continued drought, much mildewed upon most dry lands, which has retarded their growth; and, upon such situations, will not attain their usual size. They were also, in many places, materially injured by a grub at the roots; and in some instances, by a small green louse attacking the young plants. The best crops are now selling at about 7*l.* an acre. The prices for live stock (particularly for wintering) have been high all through the autumn. Fat stock is something lower; Beef being about 8*s.* per stone of 14 lib. sink; and Mutton 8*d.* per lib. The corn markets are lowering every week.—30. *Oct.*

Letter from a Correspondent near Devizes, 27th Oct.

'Thanks to a kind Providence, we have had an abundant harvest, and very suitable weather for *housing* the corn. In general, the hay has been made well; and this has more especially been the case where the grass was cut early. Crops of Clover and Saintfoin very good. Some of our *scientific* agriculturists have commenced growing *Lucerne*. This to Wiltshire is quite a new thing; though it certainly appears to answer very well. This has been a practice in Kent from time immemorial! Some of the 'cognoscenti' have ventured on the growth of Fiorin, though in so small a degree, that it could neither do them *good* nor *harm*. They have endeavoured to set forth its excellencies in venal newspapers with *anonymous* signatures, or such as are of an *obscurity nearly tantamount*. But owing to the dulness of the comprehension, and the backwardness evinced to every improvement in agriculture by the Wiltshire '*moon-rakers*,' they have failed of accomplishing the end proposed. The reason assigned for giving the satirical cognomen of 'moon-rakers' to the Wiltshire farmers, is this,—that years ago, some of the fraternity walking home, after haymaking, of a fine light evening, mistook the reflection of the moon in a pond of water for a cheese, and accordingly *raked* the water for it; their disappointment produced in themselves a great deal of chagrin and vexation; and for their posterity, honourable mention in the 'Annals of Agriculture,' and a title of distinction, which no doubt will be handed down unsullied to the latest generation.

Horses, with us, are still extravagantly dear; though certainly the farmers in this part of the island do not evince that predilection for horse-flesh which is so visible to every beholder who takes "a trip to Margate," and along the Kentish coast. Oxen, in some parts of Kent, are great rarities. The Reporter, a year or two ago, sent a plough (*i. e.* four) oxen, a driver and harness complete, into the neighbourhood of Canterbury; since which time, several gentlemen have followed the beneficial example set them by the friend of the Reporter, and have had harness made exactly similar. It has fully answered their expectations; and it ought to be mentioned, to the disgrace and discredit of the *Kentish carters*, that such was their aversion to oxen, and so fond were they of *fat horses*, that it became an absolute difficulty to get a suitable person to drive and take proper care of oxen; and this was the principal inducement for adopting the mode before alluded to. Farmers with us are increasingly convinced of their value and importance. At a sale in this neighbourhood, a plough of four-year old working oxen sold for one hundred and one pounds! All cattle indeed are dear. Sheep, at Castle, Appleshaw, Weyhill, and Devizes Green, sold very well. The stock of sheep is generally considered deficient. Wool rather advances in price. Of Turnips an average crop. We can give no very good account of spring Wheat; it is certainly a very suitable thing to succeed the new fashion of *Scotch Turnip*, which has been very much in vogue with us for the two or three last years. But it is in vain to expect a good crop of spring Wheat without a plentiful supply of manure. Vetches command high prices. The Wheat and Bean crop is considered very good. Of Barleys, about an average crop; and it has been shrewdly remarked by some, that pigs will be much dearer, as there is no black Barley. The price of Wheat, and all kinds of grain, have been gradually declining for the last three months. Best Wheat, new, 98*s.* per quarter.

West-Riding of Yorkshire Quarterly Report.

The white crops of grain in this part of the country, were generally stacked in tolerable condition; though the weather was nearly free from actual rain, yet there was so little sun-shine, that many samples turn out cold and soft in hand; in fact, corn was slow in ripening, and slower still in hardening and drying in the sheaf. The produce of wheat is moderately good; though not so good as last year. That of Barley and Oats, will be more productive than last year, if only from the superior order in which they came to the stack. The Beans are mostly out; as are, in some of the more western and backward districts, not only Beans, but Wheat, Oats and Barley. Owing to the bad weather for the last four weeks, much grain is damaged. The markets are now glutted with grain of all sorts; and rents and taxes will be heavily made at such prices as the following: Best Wheat, about 12*s.*; Barley, 6*s.* 6*d.*; Oats, 4*s.* 6*d.*; and Beans, 8*s.* per bushel of Winchester.

The weather has latterly been so wet, that Wheat has been sown

on the strong soils rather unfavourably; but much is green and looking well, though much remains to be done. The summer fallows were generally well made. Turnips were a little stunted by the drought of August and September; but the late rains appear to have brought them forward to a good crop. They are selling for feed on the ground, from 4*l.* to 6*l.* per acre; to draw off at 10*l.* Potatoes do not turn up quite so large as expected; nevertheless, they are good, and tolerably abundant.

Hay and Clover are plentiful and cheap, yet the after Grass on the meadows is scantier than usual; a deficiency more than balanced by good Turnips and Straw. Of course, lean Cattle and Sheep are at high prices. From want of money with the consumer, fat Cattle do not bear an equal or corresponding ratio. Pigs are dear. Horses of all kinds are considerably lower.

Flocks of Sheep stand the wet weather of this month, as well as can be expected; the frosts have probably prevented the too great moisture of the autumnal sward. Wool of all sorts is at high prices.

The demand for Flax and Hemp, is understood to be encouraging both to the grower and manufacturer. Rape is not much grown in this county at present, but the crop was tolerable where grown; and seed is at a fair price.

The clamour for cheap bread may be kept up for a time; but we ought all to be convinced by common sense and experience, that the grower cannot pay the enormous burthens of taxes, rents, wages, &c. &c. that he is doomed to pay, in a country so addicted to war, and martial and naval enterprizes, without a high price for his produce. But they had better clamour, than have no bread at all. In fact, without *universal ruin*, the price of *Corn must be kept up.*—*Oct.* 27.

Letter from Wales, Oct. 28.

"After writing you in the end of July, we had a continuance of fine dry weather; and in the lower part of the county the harvest commenced the second week in August. In the middle district, we were near a week later, and had on the whole a long harvest, as the corn did not all come together; but as the weather was favourable throughout, all was got in in fine condition, and the best crop we have had for several years. The Wheat, in particular, is of fine quality, and yields well in the barn; as for other grain there has been but little thrashed out, as most farmers have been busy with the Wheat Seed. It is thought that the Barley on the right Barley soils is a good crop, but on the clays it is not so. Oats are a fair crop. Peas and Beans but few sown; but what there were are a full crop. The long dry weather checked the Potatoes on dry soils, and they are said to be but a middling crop. The Turnips also were stopped for a time; but since the rains came on, they have improved wonderfully, and are a good crop in this neighbourhood. Our aftermath Grass has this year been very short, and we have cause to think it is so throughout England. As we have no great demand for Store Cattle, of course prices have lately been rather on the decline; and if they

continue to do so, the graziers will suffer, as stock of that kind was bought in the spring very dear. Fat Cattle still sell well, and Butcher-meat keeps up in price. Sheep, both fat and lean, bring good prices. Pigs have sold well through the summer and still continue to do so. There are no great improvements at present going forward in this neighbourhood; but I hear that there is application to be made to Parliament on its first meeting, to empower the proprietors to embank a considerable tract of marsh land, which is at present overflowed by the sea every high tide; and if this dyke can be made secure, the whole of this marsh can be brought under the plough, whereas at present it is in a manner waste, and grazed in common. The sowing of Wheat is far advanced. The early sown looks fine; but we were stopped for near three weeks by constant rain, which made the fallows like mortar. The weather has again taken up; and the ground works well. Another week of good weather, will nearly finish with most farmers. Wheat now sells at from 32s. to 38s. for twenty-one gallons; or if by weight, for 168 pounds: The Millers will not give more than 34s. for the best, but for seed it is as high as 38s. I do not hear of any price being fixed for Barley: the Maltsters talk of 16s., and the Farmers 20s., for 21 gallons. There have been but few new Oats sold as yet. I heard 16s. offered for Potatoe Oats; but it was refused for what we call a bushel, which is nearly four Winchester bushels.'

NOTICES TO CORRESPONDENTS.

B. C.'s letter was received, notwithstanding the error in the address. The gentleman to whom he alludes does not choose to enter into any controversy on the subject. He will find ample matter for remark in the First Branch of this Number; and we shall be glad to hear from him.

The gentleman who favours us with the Reports from Forfarshire, is requested to give the name of the plant which Mr Don cultivates so successfully; and such other particulars as he may judge of importance.

B. B.'s communication on the weight of meal contained in a boll of Oats of different weights, is just come to hand, and shall be presented in next Number.

No. LVII. will be published on Monday, 7th February, 1814.

ERRATA.

Page 302, line 20, for '*sycamore, maple,*' read '*sycamore-maple;*' and for '*aspern,*' read '*aspen.*'

D. Willison, Printer, Edinburgh.

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